

# SONORAN QUARTERLY

FOR MEMBERS AND FRIENDS OF THE DESERT BOTANICAL GARDEN

PHOENIX, ARIZONA MARCH 2017, VOLUME 71, NO. 1



DESERT  
BOTANICAL  
*garden*



## An Abundance of Generosity



None of this success would have been possible without you, and thousands of Garden members and friends just like you.



**The Saguaro Initiative began with a kick-off celebration. We started the initiative with an inspiring vision for fully realizing the Garden's mission; an ambitious five-year plan for building new facilities, exhibits and programs at the Garden; and an \$18 million goal that needed to be raised in order for all of our dreams to come true.**

Now, years later we are in the home stretch. As we go to press, the funds raised for *The Saguaro Initiative* (TSI) total \$17.5 million. And by the time you receive this issue of *Sonoran Quarterly*, our new world-class Horticulture Center will be fully operational and our new Butterfly Exhibit will be welcoming thousands of guests daily.

These are the last two major facilities to be constructed with TSI funds. Other new exhibits made possible by TSI blend so well with the existing Garden that it's hard to believe they have opened in just the past few years. These include the new *Virginia G. Piper Charitable Trust Desert Terrace Garden*, the *Jan and Tom Lewis Desert Portal* and the *Sam and Betty Kitchell Family Heritage Garden*.

As you know, the Desert Botanical Garden is a private, not-for-profit cultural institution. When we set out to raise \$18 million in 2012 we started at zero. There were no public dollars from the city, county or state. There was no bond money. There were no challenge grants, nor was there any "nest egg" of accumulated funds that we could build upon.



Instead, we turned to you. We asked you to let us share our dreams with you, and we explained to you our plans for the future. Then we asked for your support.

The response over the past five years has been amazing. The phrase "an abundance of generosity" is the best way I can describe the way you and our community have responded to the Garden's request for support of *The Saguaro Initiative*. So far, more than 1,154 different Garden members and friends have made gifts totaling just over \$17.5 million. And such gifts continue to be received—almost everyday—propelling us toward the \$18 million finish line.

To all of our members and friends who have already supported TSI, I send my heartfelt thanks. And to those who have yet to make a contribution to TSI, I ask you to consider a gift now. In three short months I will stand before the membership at our annual Members Meeting on May 25 and I hope to announce that we have surpassed our \$18 million goal.

Please visit our website today at [dbg.org/give](http://dbg.org/give) to donate to TSI online or call 480 941.3517 to make a contribution. Together we can reach our \$18 million goal by the end of May, and both the Garden and our community will be stronger for generations to come because of the abundance of generosity that you and others have provided through *The Saguaro Initiative*.

Ken Schutz  
*The Dr. William Huizingh Executive Director*

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### The Sonoran Quarterly

#### March 2017

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# Spring **IN THE** Garden

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by Dana Terrazas,  
Director of Marketing Communications

By February, Arizonans have packed away the sweaters and dusted off the flip-flops for the spring season. The opportunity to get out and experience all that Desert Botanical Garden has to offer has us counting down the days to experience our newest additions—the Butterfly Exhibit and the Hazel Hare Center for Plant Science.

## **Butterflies are Back and Better Than Ever**

The new 3,200 square foot Butterfly Exhibit located near the *Harriet K. Maxwell Desert Wildflower Loop Trail* will feature hundreds of live fluttering butterflies among the desert landscapes and stunning views of the Papago Butte, as well as a caterpillar nursery and emergence chamber. It promises to be delightful, magical and educational for children and adults.

The Butterfly Pavilion, featuring the seasonal exhibit, will provide visitors an opportunity for up close interaction with butterflies while learning about their role as pollinators, characteristics of their life cycles, and our conservation efforts to protect them.

“The Garden’s first butterfly pavilion opened in 2002. It was intended as a five-year pilot project to see if our visitors would enjoy butterflies. After just a few weeks we knew the answer to that question was a resounding “yes,” and the first butterfly pavilion went on to operate for more than 12 years,” says Ken Schutz, the Dr. William Huizingh Executive Director. He continues, “When it was time to “retire” that exhibit, we knew that we wanted to replace it with a permanent facility that was even more special – one that incorporated all phases of a butterfly’s life cycle and one that was architecturally consistent with the rest of the Garden’s unique structures.”





### See Where We Grow and Nurture Plants

The new Hazel Hare Center for Plant Science is where our staff, researchers and volunteers are at work growing, studying and taking care of rare, endangered and threatened species. Through special tours, visitors will visit the new greenhouse and see our team of professional staff germinate thousands of seeds and get cactus cuttings to take root.

### Did you know our staff conserves plants in many ways including:

- Rescuing wild plants
- Collecting and banking seeds
- Growing endangered plants so they can one day be reintroduced to the wild

### Thank You to Our Donors and Contributors

Construction of the new Butterfly Pavilion is made possible by generous donors who have made gifts to *The Saguaro Initiative* campaign. Leading the way in supporters of the new Butterfly Exhibit is the APS Foundation whose financial donation allows for the construction of the APS Foundation Butterfly Landing. Located just outside the Butterfly Pavilion adjacent to a Monarch butterfly garden display, the APS Foundation Butterfly Landing will provide a dedicated space for school groups, children and families to gather and participate in education programs.

**A special thank you** to the Kemper and Ethel Marley Foundation and Barbara and Donald Ottosen for their significant contributions to the Horticulture campus as well as our many other donors and supporters who made the space possible.



## BUTTERFLY PAVILION & HAZEL HARE CENTER FOR PLANT SCIENCE OPENING

**Saturday & Sunday | March 4 & 5, 9 a.m. to 2 p.m.**

Join Desert Botanical Garden on this very special weekend packed with butterfly and plant fun as we celebrate the grand opening.

- Visit with the butterflies
- Take expert-led tours
- Participate in hands-on activities
- Performances by Hopi Butterfly Maiden Dancers, DJ Muchacho Mike, Desert Stages
- Face painting
- Desert Landscape School mini classes
- Cactomania Central





# The Saguaro Initiative

Celebrate the Past. Shape the Future.

## Reaching the Goal

Gifts confirmed  
as of January 27, 2017



## Virginia G. Piper Charitable Trust Invests in *The Saguaro Initiative*

Virginia G. Piper Charitable Trust recently awarded a \$1.5 million grant to support projects funded through *The Saguaro Initiative*. The grant coincides with the final year of *The Saguaro Initiative* and the launch of Cactomania.

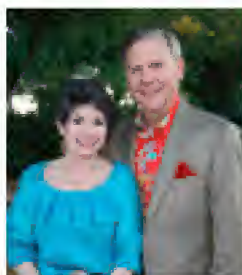
“We commend Desert Botanical Garden for its new initiatives, which help strengthen understanding about how to live responsibly and build resiliency within a complex desert ecosystem,” says President and CEO of Virginia G. Piper Charitable Trust Susan Pepin, MD, MPH.

The Garden is honored to name the *Virginia G. Piper Charitable Trust Desert Terrace Garden*, pictured above, in recognition of the Trust’s generosity. The first project completed in the current five-year strategic plan, this curvilinear

passageway of boldly tiered planters displays distinct species in the Garden’s collections, leading guests from *Ottosen Entry Garden* into the *Desert Discovery Loop Trail*.

“We are honored to receive this grant as an investment in the important work we do in plant and habitat conservation and education, on a community, regional and global scale,” says Ken Schutz. “Through its grant to *The Saguaro Initiative*, the Piper Trust continues to honor the legacy of its founder, Virginia Galvin Piper, by supporting the beauty, vibrancy and health of the Sonoran Desert.”

Since 2004, the Piper Trust has committed more than \$3 million in support of the Garden’s mission and to strengthen its financial capitalization.



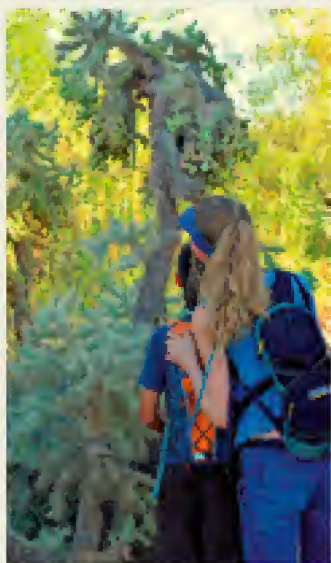
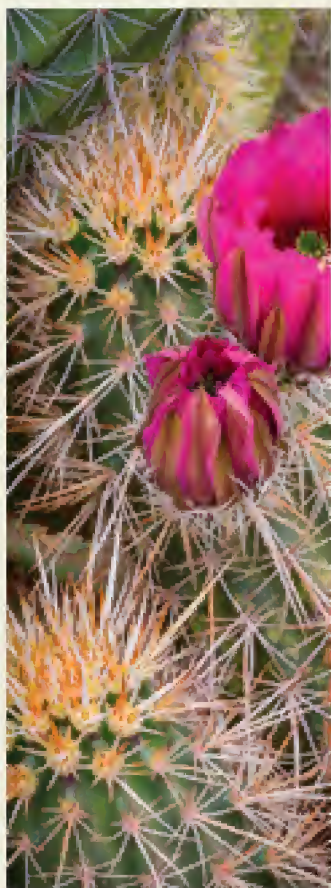
### Thank You!

We salute many donors to *The Saguaro Initiative*, including Ardie and Steve Evans, Chairs, and our leaders on the TSI Cabinet. Thank you for being so generous!





# YOU'RE INVITED!



## What is Cactomania?

The Garden invites you to join Cactomania – the public phase of *The Saguaro Initiative* (TSI). By donating to Cactomania, you become a Cactomaniac. We're looking for people passionate about ensuring the Garden's impact on Arizona for generations to come.

## How can I join?

- Register online at [dbg.org/cactomania](http://dbg.org/cactomania), on site at Admissions, Membership Kiosk or Cactomania Central located within the Garden (open during select dates).
- Make a gift of any size to TSI and you will be automatically registered. You can contribute by visiting [dbg.org/give](http://dbg.org/give), calling the Membership Helpline at 480 941.3517, stopping by the membership Kiosk or Admissions when you visit the Garden, or texting the word "CACTUS" to 91999 to give.

## Why should I join?

We hope Garden members, visitors and the community will catch the spirit of Cactomania by deepening their appreciation of cacti. Cacti are one of the top five threatened groups of organisms and they are essential to the beauty and biodiversity of the desert. You can help conserve and protect them by becoming more knowledgeable and sharing the importance of cacti with others.

Registered Cactomaniacs will receive lively monthly communications with interesting insights about cacti, special briefings about the Garden's conservation efforts, and special invitations to Cactomania Central.

## What is Cactomania Central?

On special dates, this is the place to connect with fellow cactus enthusiasts, personally meet a number of the Garden's renowned plant specialists and win cool Cactomania-themed items.

## VISIT CACTOMANIA CENTRAL

A "pop-up" station in the Garden where Cactomaniacs can meet up.

March 4, 2017  
9 a.m. to 1 p.m.

March 5, 2017  
9 a.m. to 1 p.m.

March 17, 2017  
7 a.m. to 3 p.m.

March 18, 2017  
9 a.m. to 1 p.m.

March 19, 2017  
9 a.m. to 1 p.m.

March 31, 2017  
6:30 to 8:30 p.m.

April 7, 2017  
9 a.m. to 1 p.m.

April 8, 2017  
9 a.m. to 1 p.m.

April 9, 2017  
9 a.m. to 1 p.m.

April 10, 2017  
9 a.m. to 1 p.m.

April 15, 2017  
9 a.m. to 1 p.m.

May 12, 2017  
9 a.m. to 1 p.m.

May 24, 2017  
6:30 to 8:30 p.m.

Appearances by plant experts are scheduled on select dates. Visit [dbg.org/cactomania](http://dbg.org/cactomania) for more information.





# ***Gustaf's Field Notes 1931-1934***

What it Might Have Looked Like

---

by Beverly Duzik, Director of Development

**There would be no Desert Botanical Garden without Gustaf Starck, his love of the Sonoran Desert and his lifelong fascination with cacti.**

**In celebration of Cactomania, Trustee Emeritae Martha Hunter Henderson and Garden friend Pam Hait have imagined a notebook chronicling Gustaf's excursions in the field to study cacti.**



***Gustaf Starck***  
***(1871 - 1945)***

Highlighted in "Gustaf's" Field Notes are contemporary notes from Garden scientists confirming a shocking fact that one-third of the species in the cactus family are facing extinction, mostly from poaching and habitat loss. If he were still alive today, we know Gustaf would be proud that the Garden is working locally and globally to prevent their loss.

The Garden is leading a campaign to protect and promote the importance of cacti and the biodiversity of the desert. We invite you to support this work by becoming a Cactomaniac.

Your contribution will ensure that the Garden continues to be at the forefront of research, recovery, and refuge for this wondrous plant family. In addition you will be helping the birds, insects and creatures that depend on cacti for their survival.



We invite you to read Gustaf's biography and the imagined Gustaf's notebook in its entirety online at [dbg.org](http://dbg.org).

Special thanks to volunteer Ron Lieberman for his biographical research on Gustaf Starck and to artist Katherine Callingham for creating the botanical illustrations, the Schilling Library Archives for providing historical resources, and especially to Martha Hunter Henderson and Pam Hait for bringing Gustaf's voice and passion for cacti to life.

17 May, 1931

My "Save the Desert" sign, with its arrow pointing to our house, is creating interest. Strangers ask to see my collection, which exceeds 580 specimens. Nettie and I provide tours. I'm often asked how a native-born Swede became a champion of the Sonoran Desert. I explain that, when I was a child, my father, who was a Captain in the Swedish Royal Navy, brought me special plants from far-off places when he returned from his sea voyages. His botanical interest became my passion.

Blue Palo Verde  
tree seed detail

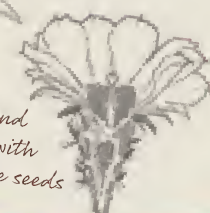


Cholla-  
mature



spines

blossom and  
fruit with  
immature seeds



Royal Navy  
crest



detail of single  
grass flower



5 June, 1931

I am determined to create a desert botanical garden. With ample water and endless land, Phoenix will grow very large, and we will lose our natural desert with its distinctive flora. Already, newcomers try to recreate the landscapes they left behind. We must educate them to the beauty of our Sonoran Desert. If we fail, what will become of the birds and insects who depend upon our desert plants for food and shelter?

buffelgrass



10 July, 1931

I received a letter from the Director of the Herbarium in Washington, D.C. complimenting my observations and sketches. He urges me to pursue my desert garden because he also sees the future threat



**CURRENT UPDATE**  
Kimberlie McCue, Assistant Director  
of Research, Conservation & Collections

Gustaf would be shocked to learn that poaching is the single largest threat to cactus today. He feared development, but illegal trading has put one-third of the world's cactus species in danger of extinction, making the family the fifth most threatened group of organisms—right up there with coral reefs, cycads, conifers and amphibians.

On a happier note, Gustaf would be gratified to see how his garden has grown to become a place of research, a partner in preservation, and a refuge for endangered and threatened cactus. The Garden holds the National Collection of Cactaceae, which includes 10 federally protected cactus species and dozens of species considered rare or imperiled.



# Enjoy this excursion into an imaginary, illustrated Gustaf Starck field notebook

## Saguaro (*Cereus giganteus*)

**Branches**  
Can be unbranched for 15 to 30 years. Branches about 9 feet from the ground.

**Habitat**  
Grows on south side of slopes, hills and valleys and sloping desert floor at 25 to 3,800 feet in elevation. Palo Verde serves as nurseplant. This species is a close relative of the cardones.



**Flowers**  
Nocturnal. May and June.  
White and waxy.  
2 to 2½ inches diameter at apex of stem. Stamens yellow.  
Can open during cool and cloudy days.



**Note on pollination process -**  
In Tucson, Lesser long-nosed bats and Mexican long-tongued bats feed on the saguaro flower nectar.

In Phoenix, bees and white-winged doves pollinate saguaro flowers in daylight.

### CURRENT UPDATE

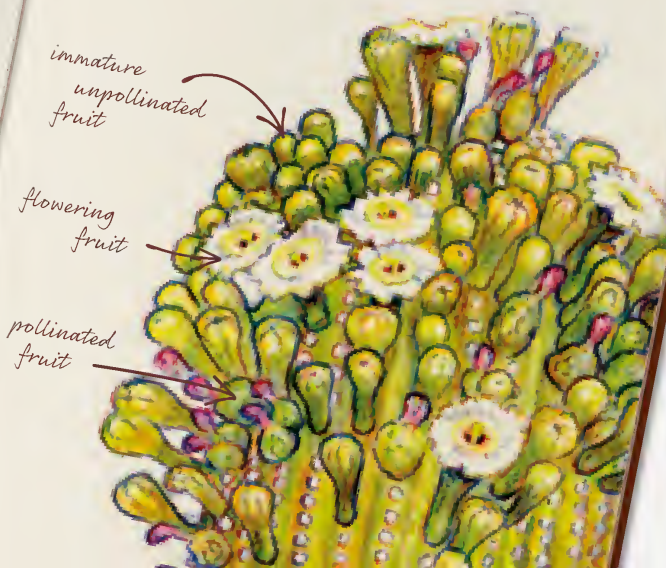
Kimberlie McCue, Assistant Director  
of Research, Conservation & Collections

The Saguaro is the sentinel of the Sonoran Desert. Gustaf's notes illustrate how important these giant plants are to the desert web of life. I wonder if he knew how improbable the odds are of a saguaro seed germinating and surviving to become the iconic symbol of the desert recognized around the world. From millions of seeds produced only a few will live and grow the 50 years or more required to begin producing flowers and fruits for the next generation of saguaros.

Gustaf's Papago Reservation is now the Tohono O'odham Nation's land.



**Fruit**  
Green and scaly. Ripens mid-June until middle of July. Light-red blush near its apex. 2¼ to 3 inches long. Seeds black. Nutritious, staple of the Papago.





## Golden Barrel (*Echinocactus grusonii*)

**Description**  
Symmetrically rounded stem armored down the ridges with clusters of golden yellow spines. Can reach 3 feet across and 4 feet high.

**Found in wild**  
East part of central Mexico in states of Hidalgo and Querétaro.

**Habitat**  
Grows in volcanic rock on slopes at altitude of 4,600 feet; sand or gravel, well-drained soils



**Flowers**  
Yellow funnel-shaped flowers grow in a ring in the central felted portion. Must be at least 14 in. across before can flower



detail of dried flower

### CURRENT UPDATE

Raul Puente Martinez,  
Curator of Living Collections

Gustaf was correct in his concern. What he could not have foreseen was the construction of Zimapán Dam in the 1990s and the creation of the reservoir in Hidalgo, which destroyed one of the few remaining habitats of the golden barrel cactus. With appreciation for the species, the government salvaged several hundred large specimens before the flood and sent them to various botanical gardens in central Mexico. In 2005, a second population with several thousand plants was discovered near the Zacatecas-Durango border, about 500 km northwest of the original population.

Gustaf would be happy to know that *Echinocactus grusonii* continues surviving in the wild despite human pressures. More than 300 golden barrels are planted in the Garden making it the cactus species with the greatest number of plants in the collection. The oldest group can be seen in a display just south of the Event Services office, and the largest planting can be found in Bopart Courtyard.

Golden barrels have been in cultivation for more than 100 years and are available in many nurseries around the world. This has reduced the need for wild collected plants for the horticultural trade and has been an important factor for its conservation.





# THE BUTTERFLY-ATTRACTING GARDEN

by Brian Kissinger, Director of Horticulture  
and Steve Blackwell, Conservation Collections Manager

**Butterflies are like blossoms aloft and are welcome visitors to Sonoran Desert gardens. Selecting the right plants that provide shelter and food just might encourage them to stay for a while.**

**Here are some tips for creating your own butterfly garden**

- Select a sunny area of your garden, sheltered from wind and with a little water source.
- When arranging a garden, place the butterfly larvae plants in the backdrop, where fed-upon leaves are less conspicuous. Place nectar plants for adult butterflies along a border, so you can enjoy close-up viewing of these colorful visitors.
- Try to place trees that attract adult butterflies near a patio or other viewing area, where you can see the butterflies feeding in the canopy. Trees will also provide shade and protection during the warmer months.

Butterflies rely on the sugars in flower nectar for their source of energy. Although butterflies can get nectar from most flowers, they prefer certain types of plants with certain characteristics. These plants often have colorful, tubular flowers, with ample nectar at the bottom of the flower for fueling their activities. Lantana plants are another favorite nectar source of butterflies. You can also try some native plants that they love, such as mistflower species, desert lavender or sweetbush. These are just a small sample of the amazing native desert plants that are used by butterflies and other pollinators.

Butterfly caterpillars require certain types of plants called host plants for them to feed on. Some examples of host plants are milkweeds for monarch and queen butterflies, passion vine for gulf fritillaries, pipevine for pipevine swallowtails, citrus plants for giant swallowtails, desert senna for cloudless sulphurs, and Baja fairy duster or pink fairy duster for marine blues. If you cannot find these at your local nursery, try asking a manager to order some for you. If they are aware of the demand, they might make them available regularly.

Trees and large shrubs are also important when creating a butterfly garden because they provide shelter where adult butterflies can stay protected during inclement weather and where their caterpillars can form chrysalises while they transform into butterflies. Fern-of-the-desert, foothill palo verde and desert hackberry are all excellent native choices for shelter plants for your butterfly garden.





## GREAT Milkweed GROW OUT™

### Latest Great Milkweed Grown Out News

Monarch butterflies have particular requirements, as they will only lay their eggs on milkweed plants. To help in the effort to rebuild their populations, the Garden initiated the Great Milkweed Grow Out in 2016 (*Sonoran Quarterly*, December 2015, pg. 4). We've recently collaborated with the Roosevelt School District, which has provided greenhouse space for milkweed seedlings; planted a butterfly garden at the Paiute Neighborhood Center near the Garden; and planted more than 100 milkweeds at the Black Canyon Heritage Park in Black Canyon City.

As part of the Great Milkweed Grow Out, we currently have seven species of native milkweeds (*Asclepias*) under cultivation. They are desert milkweed, Arizona milkweed, pine-leaf milkweed, giant sand milkweed, orange milkweed, horsetail milkweed and antelope horns milkweed. Most of these species will be available at the Spring Plant Sale as either seedlings or 1-gallon plants. For more information on the Great Milkweed Grow Out and to learn more about monarchs and the plants that support them, please visit [www.dbg.org/milkweed](http://www.dbg.org/milkweed).



You will find a large selection of butterfly-attracting plants at the Spring Plant Sale, March 17-19, 2017, including hundreds of native milkweeds. Come, select your favorites, and start building your own butterfly garden. Located in the Events Plaza Parking Lot.

#### MEMBERS PREVIEW:

Friday, March 17, 7 a.m. - 5 p.m.

#### OPEN TO GENERAL PUBLIC:

Saturday, March 18, 7 a.m. - 5 p.m.

Sunday, March 19, 7 a.m. - 3 p.m.

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PART OF THE USA TODAY NETWORK



The Sonoran Quarterly  
SPRING 2017





Photo by: Eirini Pajak

# HERBARIUM GETS A MAKEOVER





# THANKS (again) to IMLS...

**I experience a different feeling today when I walk into the herbarium compared to two years ago, let alone 17 years ago when the herbarium somehow took residence in what is today the business office. Where there used to be large, black bags containing unprocessed specimens, I now see counter tops and shelves clear of clutter, the specimens easily accessible from their own dedicated herbarium cases.**

I open an herbarium case and am greeted by specimens carefully placed in brand new folders that are no longer crammed in their cubby holes. I can retrieve a specimen from or place one into the folder without fear of it being damaged. I no longer have to decide if I should collect a plant because of lack of room in the herbarium. All this is because of the generosity of the Institute of Museum and Library Services (IMLS) grant.

## **The Grant Proposal and Intended Benefit**

In 2013 a proposal was submitted to IMLS requesting \$150,000 to support the use of best practice procedures for conserving and accessing the Desert Botanical Garden Herbarium (DES) collections.

*“DES is the only herbarium that focuses solely on arid and semi-arid plants of the world, with emphasis on the American Southwest.”*

Climate change (including long-term drought), invasive species, ground water depletion, development and grazing are challenges to the Southwest, continuing to alter its plants and plant habitats. Proper care of and access to existing and future collections from this region is critical for scientists, land managers, educators and the public to better understand plant dynamics within this changing ecosystem. The funding we sought would provide:

- New, expanded carriage/compactor system.
- New herbarium cases to relieve the overcrowded storage conditions of many specimens.
- Ability to process the hundreds of unprocessed herbarium specimens, especially those in the cactus and agave families. They could then be added to the main collection, thus making these unique specimens and all their extensive data available to the Garden and herbarium’s stakeholders.

In 1994, the herbarium also received IMLS funding for its first track and compactor system and additional herbarium cases, providing additional room for specimen storage and growth. In 2005, IMLS again funded a conservation assessment of our herbarium, identifying its strengths and challenges. In his Conservation Assessment Program (CAP) report, conservator/assessor David Rasch stated, “The next step for the herbarium includes...upgrades to environmental and storage systems, and improved access to collections, thereby refining how it can move up in the ranks among other herbaria to become better known locally, statewide and nationally as a significant treasure in Arizona.”



## Three Phases of Work Undertaken

In 2014, our grant proposal was accepted by IMLS and the project began immediately and was completed in June 2016. The activities required to accomplish all the objectives were divided into three phases.

### Phase 1

Planning and preparation with Interior Solutions staff for the installation of the new track/carriage system and new herbarium cases and removing the old compactor system.

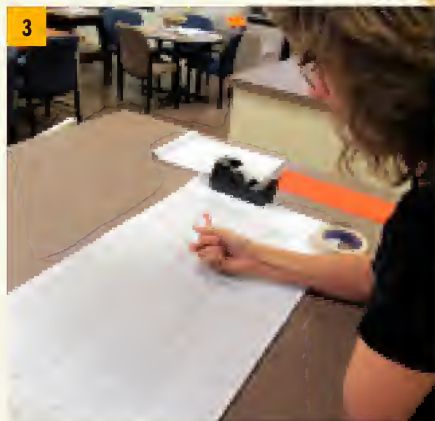
### Phase 2

Installing a new carriage/compactor system, ordering 74 new herbarium cases, installing all cases and hiring Sarah Hunkins as herbarium Collections Manager to help redistribute and process specimens, a position created as part of the Garden's match toward IMLS funding for the term of the project.

### Phase 3

The largest phase involved specimen redistribution and processing, including reorganizing processed specimens (specimens that had labels, were mounted, databased, and photographed), reorganizing unprocessed specimens (specimens that needed to be identified, their labels made, mounted, databased, photographed and refrozen to eliminate any possible insect pests), filing the specimens, replacing damaged folders and labels and processing thousands of unprocessed specimens.

This phase required a great deal of thought and preparation, and Sarah Hunkins developed an extensive (and impressive) plan involving the use of maps and charts that took into consideration current accepted nomenclatural treatments, bulkiness of specimens and expected growth of the collection.





### Processing the Unprocessed

A primary objective of this project was to process as many unprocessed specimens as possible, particularly in the cactus and agave families. Specimens waiting for processing were mainly stored in heavy-duty plastic bags that defied easy access or protection of their fragile contents. With the new equipment, we used 20 of the older cabinets to store the specimens once kept in bags, with collection numbers, place and date of collection indicated on each bundle. Since most bundles contained non-succulent as well as succulent specimens, we retrieved the latter from the bundles and placed them in cases dedicated only to this life form, with each bundle receiving a drop tag indicating collector's numbers.

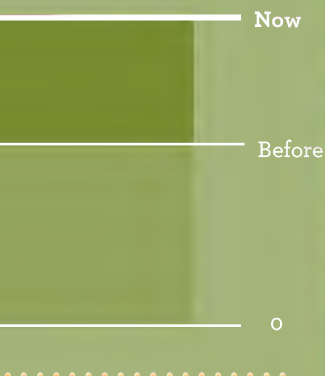
Processing is easier and more efficient after the renovation. Specimens organized by collector and collection number are now more easily retrieved from their spacious, new cases. Once specimens are identified, detailed specimen information (collector, date of collection, locality, associated species, specimen characteristics including abundance) is entered into SEINet (<http://swbiodiversity.org/seinet/index.php>), a database of millions of herbarium specimens. Labels are then printed and affixed to each specimen. For most succulent collections made by Garden research staff, photographs (habit, close-up of stems, flowers, fruits) are taken and processed with the specimens as well. DES material is then mounted, refrozen, accessioned (with DES accession number) into SEINet, photographed, and filed.







Capacity  
to store  
herbarium  
collections  
increased  
by **75%!**



*Space to  
store cactus  
and agave  
specimens  
doubled with  
44 cases.*



Photo by: Eirini Pajak

### Project Results

Seventy-four new cases were installed on the new compactor system and integrated with the old cases. Specimens were reorganized within the new and old herbarium cases and placed in new, labeled folders indicating family, genus and species. Unprocessed succulent specimens are now placed in their own herbarium cases, with drop tags affixed to the bundles indicating their contents. Non-succulent, unprocessed specimens are now stored in separate cases, likewise with drop tags indicating bundle content for added protection and ease of access.

The rest of the collection averaged an overall 30 percent expansion. Herbarium staff no longer hesitate to collect specimens, knowing these will be properly curated and without fear of their being damaged by insufficient storage space. Nearly 5,000 specimens were mounted and fully processed during the grant period and 24 volunteers provided 4,615 hours of service toward its completion.

### What the Future Holds

Because of the renovation, DES is in an excellent position to curate and expand its collection, which will experience further rapid growth due in large part to the expansion of staff and activities in the Research, Collections and Conservation Department. Six researchers are actively involved with agave and cactus family studies, including a treatise on the cacti of Arizona.



# garden news



## Introducing the new Desert Botanical Garden Blog

In between the *Ottosen Entry Garden* and the *Virginia G. Piper Charitable Trust Desert Terrace Garden* there is an unassuming concrete wall etched with the words: Conservation, Research, Exhibition and Education. As with the wall, these four pillars of the mission are ingrained in everything the Garden does.

The purpose of the blog is to bring to light Garden efforts in research and conservation, work that is sometimes overlooked because it is not obvious to guests. This weekly blog will provide a behind-the-scenes look at how the four pillars of the mission have shaped the Garden. We welcome your thoughts, input and questions.

Follow the Garden on Facebook to be notified when a new blog is posted, [facebook.com/dbgphx](https://facebook.com/dbgphx).

Read previous blog posts at [dbg.org/blog](http://dbg.org/blog).

## IMLS Grant Awarded to Education Department

The Education Department received nearly \$150,000 from the Institute for Museum and Library Services (IMLS) to fully fund planning and research for the Designing the Community Landscape project. The proposed project will help students develop 21<sup>st</sup> century skills through project-based STEAM (Science, Technology, Engineering, Arts/Agriculture and Math) experiences. The goal is to better prepare students for either college and/or for the workforce.

The project will be developed using principles of place-based education, the process of using the local community and environment as a starting point to teach concepts in language arts, mathematics, social studies, science and other subjects

across the curriculum. Students in grades 7-12 will participate in a virtual internship at a virtual firm, where they investigate and tackle a regional design challenge. They will study urban ecosystems and sustainable landscape design for public spaces, commercial and residential sites with contributions from community stakeholders.

Designing the Community Landscape will focus on place-based learning in collaboration with Roosevelt Elementary School district and the Spaces of Opportunity community site. It will work with students and teachers to develop educational programming in urban ecology and sustainable landscaping.





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### The Desert Botanical Garden Mission

The Garden's commitment to the community is to advance excellence in education, research, exhibition, and conservation of desert plants of the world with emphasis on the Southwestern United States. We will ensure that the Garden is always a compelling attraction that brings to life the many wonders of the desert.



City of Phoenix

PHOENIX OFFICE OF ARTS AND CULTURE

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# SPRING PLANT SALE

*Located in the Events Plaza Parking Lot*

### Garden Members Only Preview

Friday, March 17 | 7 a.m. - 5 p.m.  
(Non-members will not be permitted on this day)

### Open to the Public

Saturday, March 18 | 7 a.m. - 5 p.m. AND  
Sunday, March 19 | 7 a.m. - 3 p.m.

No admission charge to enter the Spring Plant Sale.

Adding easy-care, drought-tolerant plants to your garden or converting your lawn to a low-water landscape? You will find cacti, succulents, trees, shrubs, groundcover, perennials, herbs/vegetables, bare-root plants and more. Delivery available. Specialty retailers will offer unique pottery, art and other gardening products. Garden volunteers and staff horticulturists will be available to answer questions. Members receive a 10% discount on all purchases.

### BUTTERFLY GARDEN IN A BOX™

Planting your own butterfly garden? The best plants for butterflies are all at the Spring Plant Sale. *Butterfly Garden in a Box™* provides the essentials for a backyard butterfly garden: nectar plants, host plants (food for the caterpillars) and wildflower seeds, along with planting instructions.

Sponsored by:

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# SONORAN QUARTERLY

FOR MEMBERS AND FRIENDS OF DESERT BOTANICAL GARDEN

PHOENIX, ARIZONA JUNE 2017, VOLUME 71, NO. 2



DESERT  
BOTANICAL  
garden



## A Global Resource



It is a source of pride for all of us here at the Garden that we can extend our reach by collaborating with scientists and public gardens around the globe



*Desert Botanical Garden was created in 1939 to protect and preserve native plants and habitats right here in Arizona. Since then, we have stayed true to that purpose, but what many may not know is that the Garden's efforts go beyond state lines to the desert plants of the world.*

The Garden is taking national and international roles in plant and habitat conservation. Our most visible achievement to date is the recent designation of our Garden by the International Union for the Conservation of Nature (IUCN) as the global headquarters to protect and preserve threatened species of cacti and other imperiled succulent plants around the world.

As you will read in this issue, our Garden's reach extended all the way to South Africa last fall when one of our resident scientists gave the keynote address at an environmental conference. His talk focused on the unusual mound-like landforms that occur in the arid Succulent Karoo region, as well as the complex interplay of soils, plants and animals that are responsible for their formation. You will also read in this issue about Garden scientists tracking down a rare orchid species that occurs only in wetland areas of southern Arizona. This work by our researchers is linked to a national effort led by the Smithsonian Institution to conserve orchids throughout North America.



Just as in 1939, Desert Botanical Garden remains committed to protecting and preserving native plants. It is a source of pride for all of us here at the Garden that we can extend our reach by collaborating with scientists and public gardens around the globe.

Ken Schutz  
*The Dr. William Huizingh Executive Director*

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# UPCOMING EVENTS



## TOPIA

**Tuesdays - Saturdays through June 10**

Don't miss the final days of Topia. Expect the unexpected as Ballet Arizona continues its series at the Garden with a sensory performance unlike any other. Experience a presentation of movement, sound and multimedia on a stage that embraces the desert as a stunning backdrop for Ib Andersen's enchanting choreography. For ticket information, visit [dbg.org/events](http://dbg.org/events) or call Ballet Arizona Box Office at **602 381.1096**.



## MUSIC IN THE GARDEN

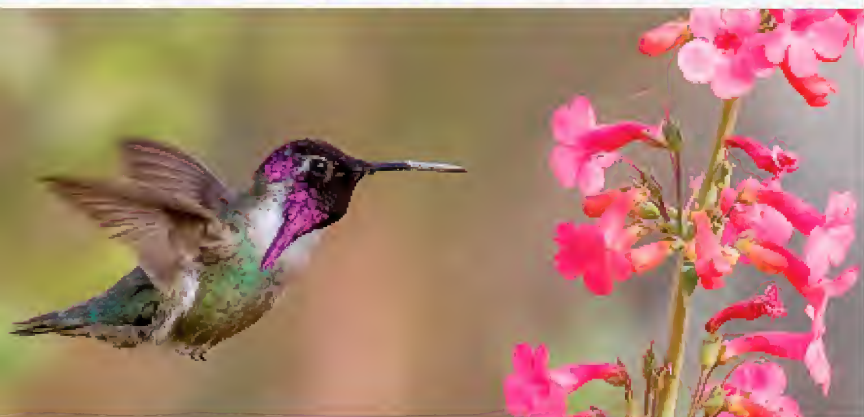
**Fridays through June 23**

Desert Botanical Garden once again offers an exciting and diverse lineup of talented performers at the Spring Music in the Garden concert series. Enjoy an evening of live performance by some of Arizona's best musical entertainment at the always stunning Ullman Terrace stage. These shows sell out quickly so buy your tickets by visiting [dbg.org/events](http://dbg.org/events) or calling **480 481.8188**. Sponsored in part by Pour Masters Bar Service and U.S. Bank.



## SUMMER CLASSES

Explore the Garden's extensive catalog of summer classes, including cooking, art, gardening, photography and more. Register for all adult education opportunities online at [dbg.org/learn](http://dbg.org/learn) or call **480 481.8146**.



## BIRDS IN THE GARDEN

**Mondays | May - Sept., 7 a.m.**

Join expert birders along the Garden trails. Everyone is welcome, including first-time birders. Bring binoculars if available.





# ENDANGERED ORCHID M.I.A.

- ✕ Missing in action: an endangered orchid, native — believe
- ✕ it or not — to only southern Arizona's fresh water cienegas.
- ✕ Lost in a sea of wetland terrain, the wispy, slight plant is well
- ✕ camouflaged by its environment and holds an unknown story.

Steve Blackwell collecting seeds of the missing orchid, which only grows in Arizona's wetland terrain.

by Jennifer Haaland, Contributing Writer

The elusive orchid was designated a new species in 1990. Dubbed the Canelo Hills Ladies' Tresses Orchid (*Spiranthes delitescens*), it was listed as endangered by 1997.

"Totally a needle in a haystack story," says Steve Blackwell, the conservation collection manager at Desert Botanical Garden who oversees the management of rare and endangered species. "We were walking through miles of wetlands looking for a small plant neither of us had seen before."

"It was last documented flowering in 2006," Research Botanist and Associate Herbarium Curator at the Garden Andrew Salywon says. "It was unlikely, but we found ourselves scouring its typical habitat to find it."

A search mission for an Arizona orchid sounds fictional in this land of desert plants. Aren't orchids exotic, tropical, rare wonders?

## Reconnaissance and Classification Intel

Half of the 200 orchid species native to North America are endangered, but luckily Ladies' Tresses is Arizona's only endangered species of the 26 orchids that grow in the state. As part of a collaboration, Desert Botanical Garden and Arizona State University (ASU) received a two-year grant from the U.S. Fish and Wildlife Service to research and assess Ladies' Tresses' population status.

"The Smithsonian Institution is the primary driver of these conservation efforts," Salywon continues about the grant's ties to the North American Orchid Conservation Center (NAOCC), which was founded by the Smithsonian Institution and the United States Botanical Garden.

"It's pretty wild, because the species can go dormant underground for years and we don't know when, or even if, they will surface again," Salywon says about the Ladies' Tresses, which is known to have existed in only five localities on the planet — all in southern Arizona.

"Ladies' Tresses don't bloom every season. The deceptive orchid looks like many other wetland plants when it is not flowering."



*“It’s a little tough when you are looking for a small plant that you have never seen before ...”*



### Boots on the Ground

A 2015 search yielded no discovery. Of the known locations Ladies’ Tresses Orchid has inhabited, only one was on federally held land.

“We needed to just get permission from one more ranch,” Salywon says about their decision to request investigation on private property.

Late July 2016, the last possible day to locate the elusive bloom under the grant’s conditions, arrived. For this boots-on-the-ground operation, just four feet traversed the many miles that day: Salywon’s and Blackwell’s.

“We finally said, ‘Let’s just go ask,’” Blackwell says about their last hope on a nearby ranch. “We were happy they were so welcoming and kind.”

“We drove up in the Desert Botanical Garden vehicle and explained we were working with the Smithsonian Institution,” Salywon comments about how they introduced themselves.

The ranchers were familiar with the orchid and pointed the team to the exact spot where they had seen them growing. So, as they had for many hot, sticky hours over the past two summers, Salywon and Blackwell fanned out across a field of knee-high wild grass.

“It’s a little tough when you are looking for a small plant that you have never seen before,” Blackwell says.

“When you do a plant survey and you don’t find the plants that should be there, you can start to doubt yourself and wonder, ‘Is it me? Am I not looking in the right places? Or is it truly not here?’” Salywon says.

Then, almost as if on cue, the delicate white flowers appeared in the wetland pasture, catching the attention of both men in the same moment.

“It was a simultaneous yell to each other across the field,” Blackwell laughs, noting even the ranchers had heard the commotion. “We were so excited. We high-fived each other and noted how hard this plant is to see.”



### Rescue and Rehab

Though the extraordinary find seems like the ending of a great mission, Desert Botanical Garden is just getting started with the Ladies’ Tresses Orchid. Next steps include preservation and education, working with the NAOCC, which provides partnership resources around the country.

“We discovered 16 plants and gathered samples of the roots and seeds,” Salywon says, commending the Smithsonian’s creation of the NAOCC to ensure orchid survival. “The orchid relies on a relationship with certain types of fungus that live within its roots in order to survive. Different orchids have different species of fungus, so we collected the roots to send to the Smithsonian Institution in order to culture and identify the fungus. With the fungus in hand, the seeds can then be germinated in the lab with the fungus it needs to grow.”

“We are also conserving a portion of the seeds in the Garden seed bank” Blackwell says. “While another portion of the seeds were sent to the Atlanta Botanical Garden, another NAOCC affiliate and experts in orchid propagation, to be grown out in their tissue culture lab.

The Garden foresees an alchemy of science and community for new orchid growth and stronger conservation messages. Salywon and Blackwell hope to continue ‘Operation Orchid’ research that aims toward reintroduction. They also envision Ladies’ Tresses no longer missing, growing at a Garden exhibit. Visitors then might glimpse little-known secrets about Arizona wetlands and endangered orchids.



THE GARDEN WELCOMES THE SCULPTURAL MASTERPIECES OF

# JUN KANEKO



Dixon Gallery and Gardens, Memphis, Tenn., *Velocity, Head*, 2009, unique cast bronze, steel table, 123.5" h x 70" w x 77" d / 2692, Photo Credit: Takashi Hatakeyama

## Bold. Colorful. Monumental.

These are all words that describe the work of ceramic artist Jun Kaneko. His work will be on display at Desert Botanical Garden, Oct. 12 through April 30. His exhibition at the Garden will include approximately 20 large-scale ceramic and bronze sculptures placed along the Garden's trails.

Kaneko's work reveals new aspects of familiar landscapes and was most recently adapted to the diverse venues of The Dixon and Chicago's Millennium Park.



“As an artist it is always very interesting to see your work in a variety of locations and environments. Desert Botanical Garden is one of the most lush environments my work could be sited in.” - *Jun Kaneko*

Sponsored by:



Jun Kaneko, born in Nagoya, Japan, in 1942 is known for pioneering the field of monumental ceramic sculpture. He came to the United States in 1963 to study at Chouinard Art Institute, in Los Angeles. He started his career as a painter but was attracted to the world of ceramics and became a part of what later came to be the American Contemporary Ceramics Movement.

His technical skills and tendency for pushing artistic boundaries led him to extraordinary accomplishments in public art, set design and architectural projects. He has taught at universities across the United States, and his work is featured in more than 70 museum collections. He has designed three operas since 2003 — including Mozart’s *The Magic Flute*, Puccini’s *Madama Butterfly* and Beethoven’s sole opera, *Fidelio* — which have been part of an artistic rethinking of classic operas.

The attraction of Kaneko’s ceramic art is that one can view without much contemplation the gently shaped forms glazed with vividly applied color in stripes, dots, spirals and squares. Kaneko uses the surface of the large shapes as a canvas for painting.

Included in the exhibition will be art work of his most recognizable Dango, (Japanese for “rounded form”) and Head sculptures, which range as high as 11 feet tall.

“Kaneko’s sculptures challenge the physical limitations of the ceramic firing process and are meant to spark interaction with the natural environments,” says Director of Planning and Exhibits Elaine McGinn. “His bold forms and dynamic colors will be stunning juxtaposed among our desert landscape.”



Jun Kaneko glazing Dango in beehive kiln, Mission Clay Project, Pittsburg, Kan., 2007,  
Photo Credit: Takashi Hatakeyama





# GEARING UP **YOUR** GARDEN

## FOR SUMMER SUCCESS

**Brian Kissinger, Director of Horticulture**

Summer is coming in the lower deserts of Arizona, bringing clear skies, abundant sunshine and monsoon relief. While these unpredictable months can bring everything from drought to flooding, knowing the patterns of the desert can help mitigate the extremes. There are steps gardeners can take to help their plants not only survive the summer but thrive.



Here are a few  
tips for summer  
gardening success  
from the Garden's  
Horticulture staff:

TIP 1



Choose as many desert-adapted plants as you can, which require little supplemental water. These plants are used to hotter temperatures.

TIP 2



Take advantage of shady microclimates, which can protect plants from harsh summer elements. They also create a comfortable area to enjoy your garden during the long, hot days.

TIP 3



Deep water trees, leafy shrubs and ground covers on a regular basis. This can reduce heat stress before a hot spell.

TIP 4



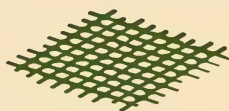
Periodically check your drip irrigation system to identify and repair issues before they become major problems.

TIP 5



Move potted plants into more protected spots where direct sunlight is not overheating them.

TIP 6



Use shade cloth to tend to stressed plants. This can reduce too much sun exposure, which can result in scalding.

TIP 7



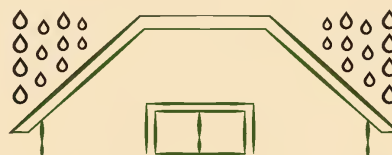
Mulching trees and shrubs can help retain moisture that soil loses rapidly in the summer. Top-dress the root zones of newly planted trees with a three-inch layer of organic mulch.

TIP 8



Plant in the proper location. If a plant needs afternoon shade, make sure it gets it.

TIP 9



Make your garden a rain garden by channeling water from your rooftop into your garden. Using rainwater is a great way to deep water plants while conserving water and saving on the bill.

TIP 10



Remember your plants cannot live without you. Tend to your garden in the early morning to avoid stress on you and your plants. You also need frequent water and shade.

TIP 11



Most of all, enjoy the fruits of your labor, but you might want to wait until sundown. Add a few white or silver flowers to your garden to brighten it under the moonlight.



# at the garden



*The Central Arizona Conservation Alliance, as well as phase one of the new horticulture campus and brand-new Butterfly Pavilion are major projects funded by The Saguaro Initiative (TSI) campaign.*

## Conserve the Preserves Luncheon

Desert Botanical Garden hosted the inaugural Conserve the Preserves Luncheon Feb. 9 to benefit the Central Arizona Conservation Alliance (CAZCA). Funds raised will support CAZCA, a Garden-led collaboration of more than 60 partnering organizations to study, protect and promote the Valley's desert mountain preserves. Leading the way in support was major event sponsor, Blue Cross® Blue Shield® of Arizona.



1



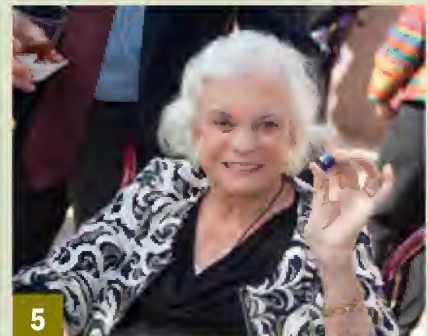
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4



5

**1** Fatimah Halim, Garry Walters and Kitty Walters attended the inaugural luncheon.

**2** Wendy Ackerman, Ian Ackerman, Event Chair Anne Stupp, Sarah Bodney, Dr. Nimalka Sivakumar and Lori Lee attended the inaugural luncheon.

**3** Dr. Wallace J. Nichols, renowned scientist and wild-nature advocate, was the keynote speaker and expressed his love for the natural world.

**4** Dr. Kimberlie McCue presented Mayor Jackie Meck with the inaugural Vision and Leadership in Conservation Award for the work he has accomplished in Buckeye, Ariz.

**5** The Honorable Sandra Day O'Connor holds a Blue Marble, which is a symbol of Dr. Nichols' initiative to inspire people to celebrate our beautiful living planet.



## Hazel Hare Center for Plant Science

Desert Botanical Garden opened Phase 1 of its new 85,000-square-foot Hazel Hare Center for Plant Science and hosted a celebration with Hare's family and friends Feb. 24. Significant support for construction of the Hazel Hare Center for Plant Science came from the Kemper and Ethel Marley Foundation, Virginia G. Ullman Foundation, Barbara and Donald Ottosen, Lee and Mike Cohn, The Flinn Foundation, SRP and many other TSI donors.



1



2

**1-2**  
Supporters received behind-the-scenes tours.



3



4

**3**  
Executive Director Ken Schutz welcomed attendees.

**4**  
Trustee Oonagh Boppart shared fond memories of her friend, Hazel Hare.

## Spring Butterfly Exhibit

The Garden celebrated the opening of the new Butterfly Pavilion March 4 and 5 with tours, hands-on activities, performances by Hopi Butterfly Maiden Dancers and Desert Stages, face painting and more. Significant supporters for construction of the Butterfly Pavilion include APS Foundation, as well as Diana and Paul Smith.



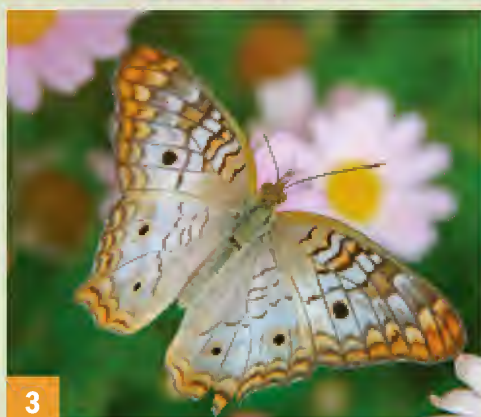
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2

**1**  
Visitors enjoyed thousands of Southwestern butterflies in the Garden's new Butterfly Pavilion opening weekend.

**2**  
The 3,200-square-foot Butterfly Pavilion is located near the Harriet K. Maxwell Desert Wildflower Loop Trail.



3

**3**  
Thousands of butterflies were released in the exhibit, where guests interacted with dozens of butterfly species.



4

**4**  
Crafts and activities were stationed around the Garden to celebrate the opening of the Butterfly Pavilion and Exhibit.



# spaces of opportunity:

CULTIVATING A BRIGHTER FUTURE FOR A COMMUNITY IN NEED



Residents of south Phoenix now have easier access to fresh, affordable produce thanks to an initiative called Spaces of Opportunity (Spaces). Desert Botanical Garden is collaborating with Cultivate South Phoenix (CUSP) and Roosevelt Elementary School District on this project, and its mission is to convert a vacant lot in south Phoenix into a thriving community farm and garden.

Once the most productive farmland in Arizona, south Phoenix is now a busy urban community, where fresh fruits and vegetables are not readily available. The concept of Spaces came up when CUSP, a grassroots coalition, was brainstorming solutions to address the community's health concerns and lack of available fresh food. Searching for a project to go beyond its existing scope, Desert Botanical Garden jumped in to help spearhead the project.

The initiative is located on 18 acres of old farmland five miles from downtown Phoenix. Organizers hope to restore the area's rich agricultural history and create thoughtful connections for the community members with the food they grow, sell and consume. In time, they anticipate it will become a neighborhood-level food system where farmers have all the tools needed to generate income, and residents can easily buy or grow local, healthy foods.

"Spaces of Opportunity is engineering a comprehensive system where farmers and farm workers are celebrated as artisans," says Nicolas de la Fuente, Spaces of Opportunity project director. "With help, we will provide our farmers with the best possible scenario to succeed."

Here are a few of the ways the community can participate in Spaces:



Make a financial donation by visiting:

[dbg.org/spaces-opportunity](http://dbg.org/spaces-opportunity)



Sign up for Our Harvest/Nuestra Cosecha, which is a Community Supported Agriculture (CSA) program. The cost is \$25 per week, and shares consist of fresh fruits and vegetables for up to four people, as well as other local products.

Sign up today:

[dbg.org/spaces-opportunity](http://dbg.org/spaces-opportunity)



Volunteer your time to help at the farm, at the farmers' markets and with administrative tasks.

Contact Nicolas de la Fuente:

[nfuente@dbg.org](mailto:nfuente@dbg.org) or 480.309.3481



For more information about Spaces of Opportunity, visit our YouTube channel at Desert Botanical Garden.





“Spaces of Opportunity is engineering a comprehensive system where farmers and farm workers are celebrated as artisans.” -*Nicolas de la Fuente, Spaces of Opportunity project director*

Farmers’ markets will also be an essential feature of the project, offering farmers the opportunity to make a profit on their harvest. Weekly fresh food baskets are available for purchase and include enough fruits and vegetables to feed two to four people for a week.

An important element of the project is running a fair and sustainable operation. Farmers must grow food without chemicals and pay anyone hired at least \$15 per hour. Spaces also pays market prices to farmers for the food grown and provides the resources they need to succeed.

“Forty-one years ago I came from Lebanon and I always wanted a farm, and this was an opportunity to follow a dream,” says Michael Hashem. “Hopefully in the next month we will see a lot of vegetables coming out.”

The Garden hosted a fundraising event called Fund the Farm in May. Financial gifts are being used to purchase essential equipment, including a tractor, rototiller, irrigation equipment, basic farm tools and seeds. These tools will allow them to work more efficiently to produce more food for the community.

“Seeing the amount of individuals who are willing to help develop a thriving community food hub in south Phoenix is inspiring,” says de la Fuente. “It is my hope that every kid in the community will get to see, understand and engage in the art of growing food.”



**The Garden’s role in Spaces of Opportunity reflects the institution’s investment in community gardening launched by *The Saguaro Initiative (TSI)* campaign. Many generous donors have contributed to Spaces and to our partners, including the following significant supporters:**

Artplace America, Cigna, Newman’s Own Foundation, NEA: Our Town, Sprouts Healthy Communities Foundation, Starbucks, The Steele Foundation, USDA Local Food Promotion Program and Vitalyst Health Foundation





# 2016

## BY THE NUMBERS

total attendance

675,452

---



36,195

membership households



4,235

species in the Garden's living collection



140

acres at the Garden,  
55 under cultivation



86

new species added





706  
volunteers



18  
types of  
volunteer  
roles



total volunteer hours  
65,771



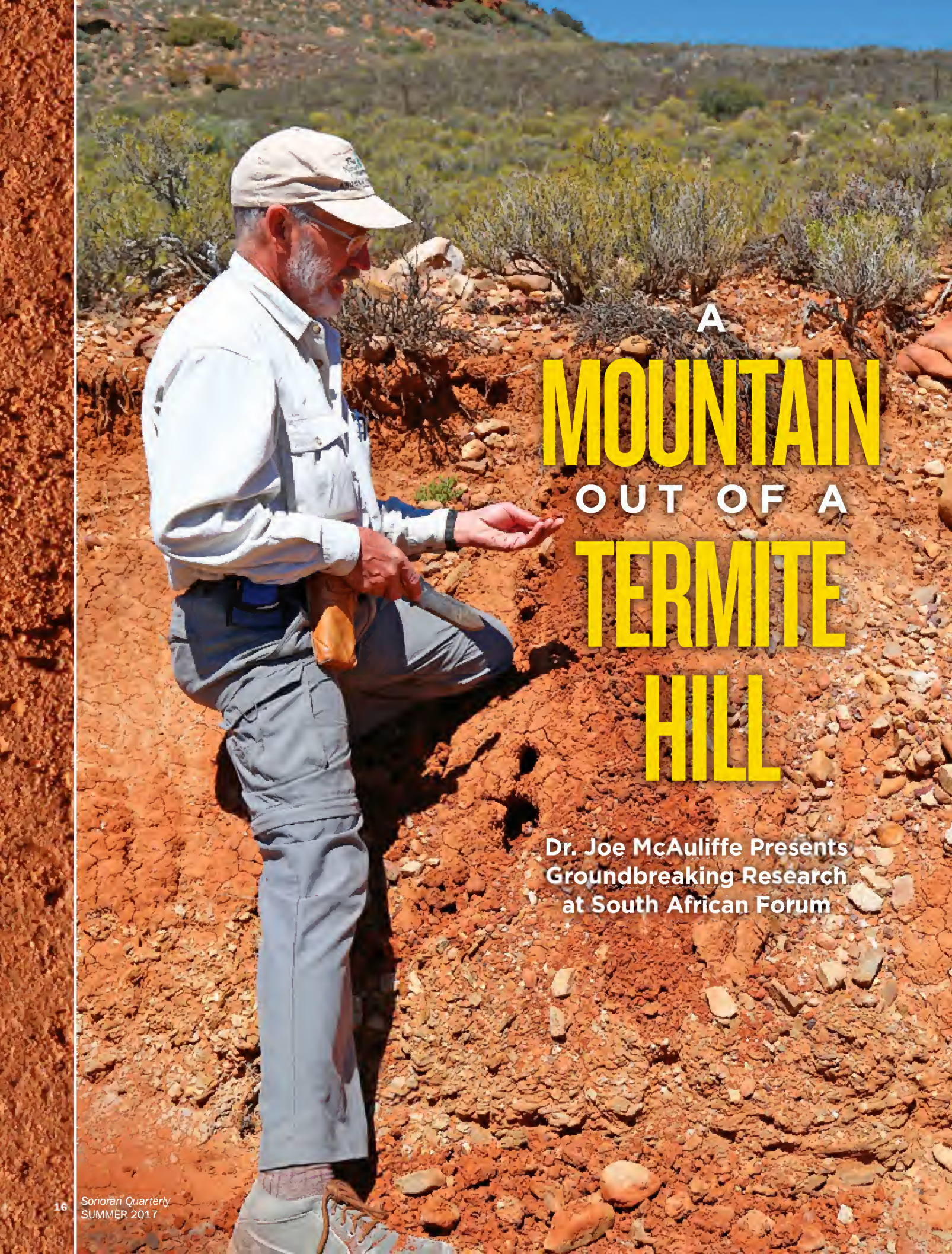
31  
number of paid employees  
volunteer work equals

97,923  
docent interactions with the public



For more information, Desert Botanical Garden's  
2016 Annual Report is available at [dbg.org/annual-reports](http://dbg.org/annual-reports).



A man with a white beard and glasses, wearing a light-colored long-sleeved shirt, grey cargo pants, and a tan cap, is kneeling on a red, rocky hillside. He is holding a small object in his right hand and a knife in his left. The background shows a dry, hilly landscape with sparse vegetation under a clear blue sky.

# A MOUNTAIN OUT OF A TERMITE HILL

Dr. Joe McAuliffe Presents  
Groundbreaking Research  
at South African Forum

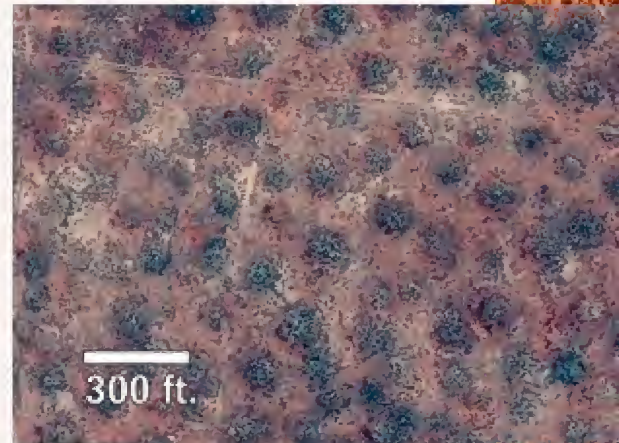


Viewed from space, thousands of square miles of western South Africa resemble the texture of ostrich skin with evenly spaced little bumps. On the ground though, these peculiar little bumps are actually giant mounds, and their formation is highly debated in the research community. Last year Desert Botanical Garden's Dr. Joe McAuliffe, traveled to South Africa to present his groundbreaking research on these mounds at the Arid Zone Ecology Forum (AZEF)—an opportunity for the Garden to contribute on a global scale to arid land research and conservation.

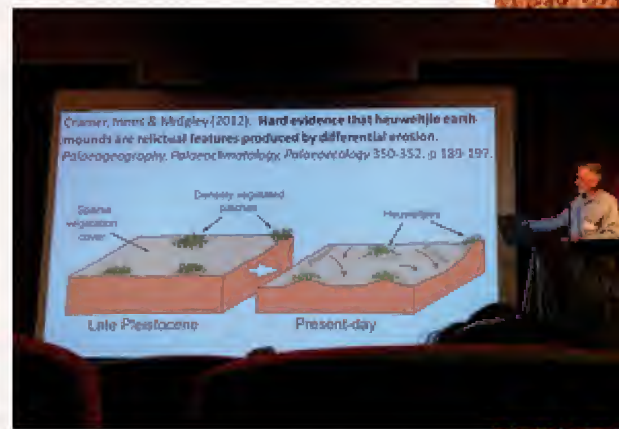
It all began in 2012 when McAuliffe, director of research, conservation and collections at the Garden, traveled to South Africa to compare its arid environments to those in the southwestern United States. His seven-week exploration took him to an arid region far north of Cape Town called Namaqualand, a hotspot of plant diversity. He was fascinated by the unusual mounds, which he discovered are called *heuweltjies* (Afrikaans for *little hills*; pronounced “hue-vil-keys”), but existing theories for how they are formed did not match his observations. Working with his colleague Dr. Timm Hoffman, director of the Plant Conservation Unit at the University of Cape Town, and Dr. Les McFadden, his soil scientist colleague from the University of New Mexico, McAuliffe introduced new conclusions based on a multidisciplinary approach.

McAuliffe was invited back to South Africa in 2016 to present this research as the keynote address at AZEF, an annual conference organized by the South African Environmental Observation Network (SAEON). During his presentation titled “*Whether or not heuweltjies: Context-dependent ecosystem engineering by the southern harvester termite*,” McAuliffe discussed the findings and conclusions from his 2012 exploration. The presentation explained the complex interactions that contribute to the formation of these hills.

“Enrichment of soil by regularly spaced termite colonies creates patches of denser vegetation,” McAuliffe says. “Those vegetation patches are windbreaks that trap hundreds to thousands of years of fine wind-blown dust and sand, creating the regularly spaced little hills. Consequently, the unique soils on these mounds and plants found on them contribute greatly to the region’s overall biodiversity.”



The dark colored patches in the above image are heuweltjies covered with denser vegetation. McAuliffe discovered this unusual texture while researching Google Earth™ images of the Namaqualand terrain prior to his 2012 trip.



McAuliffe presenting to approximately 70 forum attendees, encouraging listeners to broaden research perspectives to uncover new possibilities. Photo by Hana Petersen



McAuliffe’s presentation was inspirational for a local forum of its size. Photographed here from left to right are Liesl Eichenberger, Joe McAuliffe, Timm Hoffman, Ellewani Nenzhelele, Hana Petersen, Samantha Venter, Helga van de Merwe and Kervin Prayag.





Lush vegetation grows on the nutrient-rich mounds, which attracts sheep looking to graze. In some places, this grazing has diminished the region's natural biodiversity and productive capacity. McAuliffe emphasized the importance of understanding the natural processes that form and maintain mounds in order to manage entire landscapes in this region.

"Most researchers are very stuck in their individual disciplines such as botany, zoology, geology and so on," says Hoffman. "Joe's rich understanding of soil processes is quite unique and this knowledge has enabled him to develop insights that are completely unavailable to nearly all other arid zone biologists."

McAuliffe's contribution to the conference was impactful for a number of reasons. As a local forum in South Africa, many who were present are from the area, and his international stature was inspiring for an event of its size. His years of experience have equipped him with comprehensive insights into how plants and animals interact with one another and influence their environments. His presentation challenged attendees embrace a broader perspective when addressing research.

In commenting on McAuliffe's AZEF presentation, Marco Pauw of SAEON says, "We tend to oversimplify complex natural processes and end up struggling to explain them because they do not fit our simplistic models. Joe's presentation revealed not only the complexities involved, but also key ways to move forward in studying these complex systems."

The 2016 forum was held in Prince Albert and brought together nearly 70 attendees, which included students, established researchers, farmers, conservationist, journalists, teachers and more. After the presentation, McAuliffe returned to Namaqualand, where he continued his field research with colleagues and students from University of Cape Town.

---

(Top to Bottom) McAuliffe photographing a tall, conical mound created by southern harvester termites in Namaqualand. His research focused on why this termite species builds this kind of mound in some environments but occupies low, rounded heuweltjies in others.

In full field gear and brandishing a Japanese gardener's knife to probe the soil, McAuliffe explains features of the soil beneath a small heuweltjie located near the town of Nuwerus in Namaqualand.

McAuliffe pointing out traces of a former underground "hive" of the termite species he investigated. This hive was exposed along the cut bank of a dry desert stream.



# *garden news*



## **Garden's Executive Director Appointed to Presidential Board**

During his final days in office, President Barack Obama appointed Desert Botanical Garden's very own Executive Director Ken Schutz as a member of the National Museum and Library Services Board. Schutz is one of 20 presidentially appointed members trusted to advise the Institute of Museum and Library Services (IMLS) on general policy, practices and on selections of the National Medals for Museum and Library Services. IMLS supports 123,000 libraries and 35,000 museums in the U.S. to ensure there is public access to knowledge, culture, heritage and learning.

"It is such an honor to represent the museum profession by sitting on this board," says Schutz. "IMLS funds so many important projects for museums and libraries, often those for which local funds would not be available. For example, IMLS funded the diesel generator at the Desert Botanical Garden that would start up in case of a power failure, and keep freezers running that contain our precious seed bank collection and DNA samples from rare and endangered desert plants."

## **Garden Awarded Grant to Fund Research and Conservation Marketing**

Virginia G. Piper Charitable Trust awarded Dr. Kimberlie McCue, director of research conservation and collections, a \$50,000 Piper Fellows Organizational Enhancement Award to explore conservation messaging, marketing and promotion. The grant will help the Garden leverage its website [dbg.org](http://dbg.org) and social media channels, to highlight and position the Garden's conservation and research work that it delivers to its community, state and the world. The Garden will commit a dollar-for-dollar match, increasing the reach of the project to raise awareness and engagement. Dr. McCue was eligible to apply for the grant as part of her Piper Fellowship.



## **\$149K Grant Awarded to Garden Researchers**

Dr. Lucas Majure, the Garden's specialist on New World Succulents, was awarded a two-year grant of \$149,000 from the National Science Foundation (NSF) to study various aspects of cactus research. Majure is working in collaboration with Dr. Martin Wojciechowski of Arizona State University and Dr. Michael Sanderson of University of Arizona to investigate specifically the details of cactus chloroplast evolution, which has a very unusual genetic structure. This research will play a tremendous role in understanding photosynthesis of the species — an opportunity for the Garden to pioneer this research.





## SONORAN QUARTERLY

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### Desert Botanical Garden's Mission

The Garden's commitment to the community is to advance excellence in education, research, exhibition, and conservation of desert plants of the world with emphasis on the Southwestern United States. We will ensure that the Garden is always a compelling attraction that brings to life the many wonders of the desert.



**City of Phoenix**

PHOENIX OFFICE OF ARTS AND CULTURE

Partial funding provided by the Phoenix Office of Arts and Culture through appropriations from the Phoenix City Council.



Printed on recycled paper using soy-based inks.

# FLASHLIGHT TOURS

Thursdays & Saturdays

May 27 – Sept. 2 | 7 - 9:30 p.m.

(Included with membership or paid Garden admission.)

Whether it is date night or family night, come explore Desert Botanical Garden in a whole new way. Flashlight Tours are sensory adventures to see, hear and feel how desert nights shimmer. Guests beam their own flashlights along the self-paced trails to capture the plants and animals that come to life in the desert after dark. Nocturnal Garden explorers can experience a different adventure every night through activities, promoting play, education and adventure.





# SONORAN QUARTERLY

FOR MEMBERS AND FRIENDS OF DESERT BOTANICAL GARDEN

PHOENIX, ARIZONA SEPTEMBER 2017, VOLUME 71, NO. 3



DESERT  
BOTANICAL  
garden





## DESERT JOURNAL

# PURPOSE & *Tranquility*

When the calendar crosses an equinox, I always pause to mark the transition and think about where the Garden has been in the past six months, as well as where we are headed for the next half-year.

*Since the first day of spring, we have accomplished so much: successfully reaching our goal for The Saguaro Initiative, opened our wonderful new Hazel Hare Center for Plant Science, witnessed the profuse yellow blooms of the palo verde trees and coddled our plants through yet another hot summer.*

As I look forward to the next six months, I am excited by the prospect of so many important events on the horizon: our fall festival season, Las Noches de Las Luminarias, the official reopening of the Desert Landscape School and the annual seeding of the Harriet K. Maxwell Desert Wildflower Loop Trail.

I take great pleasure in the rhythms of nature, as they provide me with a sense of purpose and tranquility. I hope the same is true for you and that you come to the Garden often to get in touch with

the beauty of the desert, finding solace in the harmony of the natural world. The Garden is here to provide everyone in our community with a safe and beautiful place to relax and rejuvenate. We celebrate differences and do our best to protect the fragile biodiversity of the Sonoran Desert.

Ken Schutz

Dr. William Huizingh Executive Director



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Courtesy of Karli Foss

Conservation Collections Manager Steve

Blackwell has expanded his work with

seedlings in the new greenhouses. Read

more about his successes on page 5.

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© Desert Botanical Garden



# SAVE *the* DATE

for these Garden Events

Fall Festivals Sponsored by 



## OFRENDA EXHIBITION

Oct. 27 - Oct. 28 | 8 a.m. - 5 p.m.

Oct. 29 - Nov. 7 | 8 a.m. - 8 p.m.

Ofrendas, or "offerings," are part of the traditional Mexican celebration of Día de los Muertos. They are created to remember and honor the memory of ancestors and loved ones who have passed. The act of preparing an altar for the dead helps transform grief into acceptance. Traditionally the altars are adorned with photographs, flowers, decorations, candles, food and drink. This year, 12 local artists will create ofrenda installations that explore the essence of water issues and celebrate the element's vital connection to all living things.



## CHILES & CHOCOLATE FESTIVAL

Friday - Sunday | Nov. 10 - 12 | 10 a.m. - 5 p.m.

Chiles & Chocolate Festival is the ideal recipe for a sweet and spicy weekend. Sample and shop your way through Arizona's top chile and chocolate vendors. Indulge in gourmet chocolates, zesty sauces, fresh fire-roasted chiles and other handcrafted delights. Listen to traditional and contemporary Latin fusion music, and enjoy live performances of Mexican, Brazilian and Caribbean dance on Boppart Courtyard.

Sponsored by: Amica Insurance



## DÍA DE LOS MUERTOS CELEBRATION

Nov. 4 - 5 | 10 a.m. - 5 p.m. | La Procesión each day 5 - 6 p.m.

Celebrate the timeless traditions of an international holiday with roots in ancient Aztec culture. Experience music and dance performances, crafts, face painting and a Mercado filled with handcrafted art, jewelry and other wares. Enjoy a paleta, contribute to the Community Altar and end the day with La Procesión—a procession by the performers and audience members—and a traditional burning of troubles.

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3  
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## MUSIC IN THE GARDEN

Fall 2017

Select Thursdays  
& Fridays  
Oct. 6 - Nov. 17

Don't miss an exciting and diverse lineup of talented local bands. These shows sell out quickly so buy your tickets soon.

Sponsored in part by: POUR MASTERS



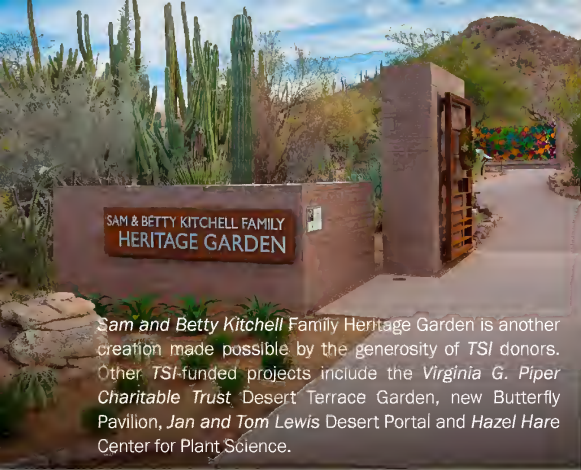
## DOGS' DAY IN THE GARDEN

Saturday | Nov. 18  
8 a.m. - 2 p.m.

Bring the whole family—dogs included—for a walk on Garden trails. Meet other dog lovers, heel for family photos, learn about local dog-related nonprofits, shop and enjoy samples with your pup. A dog admission fee of \$4 benefits the Arizona Humane Society.

COME - MEET - PLAY  
DOGS' DAY  
in the Garden 





Sam and Betty Kittell Family Heritage Garden is another creation made possible by the generosity of TSI donors. Other TSI-funded projects include the Virginia G. Piper Charitable Trust Desert Terrace Garden, new Butterfly Pavilion, Jan and Tom Lewis Desert Portal and Hazel Hare Center for Plant Science.

# The Saguaro Initiative

Celebrate the Past. Shape the Future.

by Jessica Dunham, Contributing Writer

## Surpassing the Goal

Gifts confirmed  
as of Sept. 1, 2017

\$18,082,800

\$18 million

\$16 million

\$14 million

\$12 million

\$10 million

\$8 million

\$6 million

\$4 million

\$2 million

In 2013, the Garden launched *The Saguaro Initiative (TSI)*, an \$18-million plan designed to celebrate the Garden's 75<sup>th</sup> anniversary and set the course for the next 75 years. Now, the Garden is proud to announce this ambitious effort was a success.

Deeply rooted in the Garden's commitment to research, education, conservation and exhibition, *TSI* endeavored to fulfill the Garden's vision to be the premier center in the world for the study and display of desert plants.

"Reflecting on when we started planning seven years ago, I'm inspired by the bold plans we created," says Board President Shelley Cohn. "To see the initiative's financial goals surpassed and all projects completed is truly rewarding."

### Cabinet Leaders Pave the Way

The *TSI* Cabinet—a group of trustees, community leaders and volunteers—was instrumental in *TSI*'s success. "All of the *TSI* Cabinet members, especially Chairs Ardie and Steve Evans, were amazing leaders," says Dr. William Huizingh Executive Director Ken Schutz. "There's no better way to lead than by example; Ardie and Steve were generous with their time, talents and creative insights."

"I appreciate the leaders of the fundraising efforts, including Jacquie and Bennett Dorrance, Ardie and Steve Evans and all the donors who have contributed and been a part of this tremendous endeavor," says Cohn.

### Community Giving

On-site donations, a new form of fundraising for the Garden, reaped significant benefits. Garden staff raised \$71,000 from generous visitors and members. Not only did these funds contribute to the overall goal, but they also demonstrate the passion that guests have for the Garden and how that appreciation transforms into positive action and financial support. The Garden will continue collecting on-site *TSI* donations through Dec. 2017.

### A Major Grant

A \$300,000 grant from the Arizona Community Foundation (ACF) catapulted *TSI* past its \$18 million goal. That grant supported





One of the initiatives of TSI was the development of the Master Plan for the future Myrna H. Berger Children and Family Garden.



the Master Plan for the future Myrna H. Berger Children and Family Garden. Once it's built, the three-acre "garden within the Garden" will inspire lifelong learning about nature and the desert for children and families.

"We were thrilled to support the plan for Myrna H. Berger Children and Family Garden," says ACF Chief Philanthropy Officer Jacky Alling. "The future garden will provide opportunities to engage intergenerational participants through fun, educational activities. Through our donation and our partnership with the Garden, we can make an enduring environmental experience available for families for generations to come."

### New Programs Launched by TSI

The Central Arizona Conservation Alliance (CAZCA) is a network of people and organizations who work together to study, protect and promote the Valley's desert mountain preserves. Spaces of Opportunity aims to transform a south Phoenix community from a food desert into a food oasis, reviving its rich agricultural roots.

"I am awed by the support these two pilot projects have received. The funding will allow them to mature as part of the Garden's ongoing programming," Schutz says. "Seeing two new ideas take root and flourish with the support of so many donors is especially heartening."

**Save the date for future events to support the programs launched by TSI:**

**Feb. 8, 2018**

"Conserving the Preserves," a luncheon to benefit CAZCA

**May 17, 2018**

"Fund the Farm," an evening party to benefit Spaces of Opportunity

### It Takes a Village

With great leadership and the unwavering support from Garden members, visitors and other donors, TSI brings new life to the Garden's commitment of providing engaging experiences. This continued support will be as important as ever as the Garden embarks on the next 75 years.

### A major TSI goal completed the first phase of the Hazel Hare Center for Plant Science.

While the Garden hopes to continue developing the facilities, staff note that the spaces have gone from "cave-man to state-of-the-art." They are already seeing the incredible benefits of this investment. The Garden's plants are not just surviving — now they are thriving!



Several plants that were struggling before are now blossoming—some for the first time in the new center.



New growth is emerging on plants that haven't grown in years.



Temperatures inside the greenhouses are an average of **25 DEGREES** Fahrenheit cooler than outside

**345 STUDENTS**

have used the brand-new Marley Horticulture Learning Lab since March, including 69 Desert Landscape School (DLS) students.



As of July 2017, the new cisterns on the north side of the greenhouse have harvested more than

**2,500 GALLONS** of rainwater.



# JUN KANEKO

SCULPTURE AT DESERT BOTANICAL GARDEN



OCT. 13 - MAY 13



*Throughout the Garden*



INCLUDED WITH MEMBERSHIP  
OR GARDEN ADMISSION

Sponsored by



Additional support provided by  
Sunstate Equipment Co.

The Garden's renowned cactus collection is about to receive colorful company when Jun Kaneko Sculpture at Desert Botanical Garden opens on Oct. 13. His work has been exhibited at Phoenix Art Museum and ASU Museum, as well as more than 70 collections nationwide. However, never before have Arizona residents been able to explore approximately 20 pieces together in an exhibition like this.

Kaneko is among a vanguard of artists pushing the limits of materials—ceramics, glass and bronze—in the contemporary art world. He is intrigued by the dynamics of scale, space and material.

Each handmade ceramic sculpture is composed of 2-inch clay slabs added slowly over the course of many weeks to become its final form. Kaneko reaches



into the form and pulls, presses, paddles and guides the Dango or Head into the new form it will take, often reaching 10 to 15 feet high.

His largest pieces are created inside beehive-shaped kilns that are 40 feet in diameter with a 20-foot-high ceilings. The sculptures are bisque-fired in preparation for glazing followed by the final firing. The entire process can take several months to complete.

Kaneko's glazing technique involves the use of masking tape and colored slips on the ceramic 'canvas' to arrange straight, curving and spiraling lines, creating interplay of abstract imagery on his three-dimensional surfaces.

All of Kaneko's works are untitled to encourage direct observation of each piece, intensifying the viewer's visual engagement.

Born in Japan and currently residing in Omaha, Neb., Kaneko is internationally recognized as being at the forefront of the ceramics movement. Known for the ambitious scale of his ceramics projects, Kaneko is one of the few artists in modern history to attempt clay pieces of such size and weight.

"It is my hope that artistic expression goes beyond words; transcending the viewer from the critique of language to pure experience," says Kaneko.

Take a **sneak peek** of  
the sculptures that will be on exhibit >>>>  
throughout the Garden ...



Find **six**  
**Tanuki**  
friends in the  
*Jan and Tom Lewis*  
Desert Portal.



Tranquility awaits  
with **seven**  
**Dangos**  
in Stardust  
Foundation Plaza.



Contemplate  
with the **six**  
**Heads**  
located  
throughout the  
Garden.



Discover **two**  
more Dangos in  
the *Kitchell Family*  
Heritage Garden and  
Desert Discovery  
Loop Trail.





1

SEPT. 30 - NOV. 19  
9:30 A.M. - 5 P.M.



Harriet K. Maxwell Desert  
Wildflower Loop Trail



INCLUDED WITH MEMBERSHIP  
OR GARDEN ADMISSION

## JOIN US

SATURDAYS, OCT. 7 - NOV. 18 FOR  
FAMILY ACTIVITIES FROM 1 - 3 P.M.

Each week offers different educational  
programs to learn more about butterflies,  
caterpillars and milkweed.

*Weekly family activities sponsored by*

**SPROUTS**  
HEALTHY COMMUNITIES  
FOUNDATION

Don't miss the Garden's fall butterfly exhibit—

# MIGHTY MONARCHS & THE PLANT PROTECTORS

Mighty monarch butterflies return to Desert Botanical Garden Sept. 30, and they are bringing friends. See monarchs and other plant-protecting insects at the Garden's fall butterfly exhibit, which invites visitors to take a closer look at the insects that care for the desert environment.

From pollinators to predators, insects have amazing powers and play a variety of roles in the desert. The fall exhibit encourages visitors of all ages to learn how they too can be a plant protector, supporting and protecting beneficial insects and pollinators.



# MEET THE PLANT PROTECTORS



## MONARCH BUTTERFLY

The vibrant orange and black wings of monarch butterflies make them one of the most beloved insect species, but did you know their populations have declined by as much as 90 percent in the last 20 years?



## BEE

With more than 1,000 species, the Sonoran Desert has one of the most diverse populations of native bees in the world.



## ANT

Without ants, pests might rule the earth. Ants keep nuisance insect populations in check. Just one colony can consume 6 million small prey per year.



## LACEWING

Lacewing larvae are voracious predators. Their favorite foods are garden pests, including aphids and white flies. They can help reduce pesticide use.



## MOTH

Many Sonoran Desert plants rely on moths for pollination. Without this nocturnal insect, these plants would not be able to reproduce.



The Garden supports monarch butterfly populations by promoting the growth of Arizona's 29 different milkweed species. It is the only type of plant monarchs can lay their eggs on and their caterpillars eat. Therefore, monarchs cannot survive without milkweed.

With the help of staff and volunteers, a partnership with the Brooks Community School Greenhouse and funding from Monarch Joint Venture and the Bureau of Land Management, Great Milkweed Grow Out has resulted in:

- 15,000 native milkweed plants grown
- 40,000 seeds planted
- 120,000 seeds collected
- Six pollinator gardens planted at schools and parks

"Great Milkweed Grow Out has been successful for the plants, butterflies and the community, creating habitat stepping-stones that monarchs can use as they move around the city," says Dr. Kim Pegram, insect ecologist and exhibits specialist. "We have also engaged hundreds of schoolchildren through the planting of new pollinator habitats at local schools. Our work is not done though and we are excited to grow even more milkweed plants and reach more communities."

For more information about our Great Milkweed Grow Out, please visit [dbg.org/milkweed](http://dbg.org/milkweed).

Great Milkweed Grow Out activities are supported by





# LANDSCAPING ADVICE

*at your fingertips*



For 20 years, Desert Botanical Garden's Desert Landscape School (DLS) has been a leading educator in desert landscape design, installation and maintenance. The Garden greatly expanded its DLS offerings this year when it published "Desert Landscape School: A Guide to Desert Landscaping & Maintenance."



The DLS Guide is the only comprehensive resource of its kind to teach techniques and best practices for designing, installing and maintaining attractive and sustainable landscaping. Explore how you can apply its tips to your garden or career, including:

- How deserts are formed and key desert plant adaptations.
- How to plant, prune and diagnose plant problems.
- Sustainable irrigation practices.
- How to design and install desert landscapes.

"A key part of our commitment to the community is education about desert plant care, and this guide is an excellent example of how we are fulfilling that promise," says Ken Schutz, *Dr. William Huizingh Executive Director* at Desert Botanical Garden. "This guide is an indispensable resource replete with information about what to do and not do when creating and caring for a desert garden."

The publication was supported in part by the Flinn Foundation, with funds provided through a grant from the Arts and Culture Initiative for Financial and Creative Health under planning grant No. 1983. We thank the Flinn Foundation for helping make the DLS Guide a reality.

The guide is available for purchase for \$72 for Garden Members and \$80 for non-members in the **Desert Botanical Garden Shop** or online at [gardenshop.dbg.org](http://gardenshop.dbg.org).





Take a peek inside the pages of Chapter 3, which explores planting and maintenance.

## PLANTING AND MAINTENANCE

"Adding plants to a landscape can provide a variety of benefits, but only if the plants you select are well matched to the site conditions and display the health and vitality needed to perform their intended functions in the landscape.

Of all the decisions you make to ensure the success of longevity of plants you place or transplant into a landscape, location is the most important. The proper match of a particular plant species to its site conditions will have greater bearing on the plant's health than any amendments or remedial actions you may take to correct problems. Always consider the mature size and architecture of the plants too—it should match the desired functions for the space in years to come.

Chapter Two highlighted some of the species that can be used in a desert landscape and listed the ideal growing conditions for each plant. In this chapter, we'll detail important plant procedures you'll need to know after you make the appropriate plant and site match. We'll also look at the follow-up care required after planting, and we'll discuss maintenance needed during the lifespan of the plant, including pruning and a systematic process for diagnosing plant problems."



171 pages of state-of-the-art guidance, pertinent examples, vibrant images and informative illustrations



Reviewed by 16 Garden staff members and 30 outside researchers, experts and educators

## Looking to Dig in Deeper?

Are you interested in becoming a better desert gardener? DLS offers the opportunity to learn from our experts about all aspects of desert landscaping. After completing the certificate program, graduates will have a comprehensive understanding of how to design and maintain their garden, start a new career or advance a current one. Students learn directly from Garden staff about a number of topics, including plant species identification, diagnostics and sustainable landscaping practices. No prior experience is required to attend the School.

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# YOUR FALL HOME GARDENING GUIDE

*Tips to Spruce up Your Home Garden in Autumn*

By Kenny Zelov, Acting Director of Horticulture

After the intensity of the summer heat, nighttime temperatures begin to drop. Desert plants can finally relax and begin to recuperate. Fall is an ideal time to plant, because the cooler temperatures give plants several months to adapt to their location, which can help them ensure survival for their first year. With the following tips, your garden will be happy year round.





## CLEANUP AND PRUNING

Start by cleaning up and removing any plants that did not make it through the summer. Remove debris, and spruce up garden areas. Remove branches that are in the way of paths, and lift tree canopies to give light and air to understory plants. Make sure you research the best ways to prune.



## ADJUST YOUR IRRIGATION SYSTEM

Many plants will need less water in the fall months. Depending on the type of plants you have, decrease the frequency of irrigation as temperatures drop. Around Thanksgiving, you can turn off your irrigation system for your trees, shrubs and succulents until the middle of February. Continue to give them water once a month if no winter rain has fallen.



## INCORPORATE RAINWATER HARVESTING

Water harvesting is a technique that incorporates the efficient and conscientious use of rainwater runoff in the landscape. This technique helps plants look and grow better, as well as prevents water from escaping the area. Learn more about these techniques through Desert Botanical Garden classes.



## PREPARING FOR WILDFLOWERS

If you have had wildflowers in your garden in the past, new seedlings come back when the conditions are appropriate. If starting seasonal wildflowers for the first time, consider ordering native seeds that bloom in winter, spring and summer. Seeds are available at local nurseries, online or at the Garden's Fall Plant Sale.



## SOWING WILDFLOWER SEEDS

It is important to select a spot that will get between six to eight hours of full sun daily during the winter season. Sow the seeds evenly in the area and gently rake them into the ground to protect them against the wind and displacement from water or by animals. In October, gently hand water the area for a few minutes daily until you see that the seeds have germinated. Reduce the frequency of irrigation to weekly if there has not been enough rain to maintain the seedlings.



## CREATE A WINTER PLAN

It is necessary to know which plants in your garden are susceptible to frost and to monitor frost warnings. Protect these plants with frost cloth, ensuring that the cloth reaches the ground and keeps them covered. Only cover for the duration of the frost event and then remove promptly until the next frost warning.



# ABC's *of the Garden*

---

The beauty of desert plants and wildlife surrounds visitors from the moment they walk into Desert Botanical Garden. It is easy to get lost admiring the beauty of the Garden's diverse array of plants and animals, but what many do not know is that each plant and animal has its own story. As with any story, the ABC's are the best way to start.

**Check out these 26 facts about plants and animals in the Garden.**





# A

## AGAVE



Agaves reach maturity at 10 to 30 years of age before flowering. The flower consumes so much of an agave's energy that it cannot continue to grow. Good news is that the small "pups" live on after the main plant blooms.

# B

## BOOJUM

The name of this peculiar plant comes from Lewis Carroll's "The Hunting of the Snark." The book contains a mythical creature called the "boojum," and explorer Godfrey Sykes was reminded of this creature when he first saw the plants and dubbed them boojums.

# C

## CREEPING DEVIL

Look carefully at the north side of Webster Auditorium to see our oldest accessioned cactus in the collection. The Garden's creeping devil cactus has grown 45 feet from its original planting site.

# D

## DRAGON FRUIT

Dragon fruit are created by an unusual species of cactus native to Central America. With bluish stems and magnificent flowers, they produce delicious pink fruit.

# E

## ELEPHANT TREE

The 20-foot elephant tree by Webster Auditorium is among the 10 oldest plants in the Garden. While its sap smells pleasant, its foul taste deters herbivores.







**F**

## FISHHOOK BARREL CACTUS

Don't let myths fool you about drinking from the barrel cactus. Not only would cutting this cactus harm this precious plant, but consuming any part of it will cause an unpleasant stomach reaction.

**G**

## GOLDEN BARREL CACTUS

The Garden has golden barrel cacti throughout the trails, but this species is endangered in its native region of Central Mexico.

**H**

## HEDGEHOG CACTUS (ARIZONA)

The Arizona Hedgehog Cactus was listed as an endangered species in 1979 and was among the first plants listed under the Federal Endangered Species Act.

**I**

## INDIAN PAINTBRUSH FLOWER

Did you know the Indian Paintbrush is a genus of approximately 200 different species?

**J**

## JACKRABBIT

The long ears of a jackrabbit are more than adorable. They work as air conditioning and can transfer excess heat away from the body where it is transferred to the air.

**K**

## KING SNAKE

Don't be alarmed if you see these striped reptiles crossing the Garden trails. While they grow to be 2 to 4 feet long, these snakes are non-venomous.

**L**

## LITHOPS

These obscure succulents look like stones until they blossom with brightly colored flowers.



**M**

## MILKWEED

Milkweed is the only plant monarch butterflies lay their eggs on and caterpillars eat. In fact, a decline in milkweed plants contributed to a 90 percent decline in monarch butterflies.



**N**

## NIGHT-BLOOMING CEREUS (QUEEN OF THE NIGHT)

This inconspicuous cactus grows under desert shrubs and is difficult to locate. They become easier to spot during a small window of the year when it blossoms magnificent flowers.

**O**

## OLD MAN CACTUS

It is not difficult to spot the old man cactus throughout the trails of the Garden. The shaggy, white cactus has "hairs" that are modified spines to protect it from the sun and frost.





# P

## PRICKLY PEAR

The Garden has various prickly pear species along its trails. While they are very colorful, many have glochids, or tiny hair-like spines, that easily detach and get lodged in the skin. Better to not touch these.



# Q

## QUAIL

These adorable birds prefer to run rather than fly. In fact, shortly after hatching, the chicks are on the move, permanently leaving their nests under the protection of their parents.

# R

## ROADRUNNER

One of the most recognized desert bird species, courtship for roadrunners can include a mate presenting a twig or piece of grass to another.

# S

## SAGUARO

Did you know it takes approximately 50 to 70 years years for a saguaro cactus to grow an arm? Usually the more arms the cactus has the older it is.

# T

## TEDDY BEAR CHOLLA

Don't be confused by its adorable name. Teddy bear cholla spines have tiny hooks on the end that get embedded in the skin at the slightest touch.

# U

## UEBELMANNIA PECTINIFERA

It may have a very long scientific name, but this Brazilian cactus species grows less than 2 feet tall. You can see this rare cactus on a tour of the *Hazel Hare* Center for Plant Science.



# V

## VERDIN

Verdins seem undaunted by extreme temperatures and have been seen on both the coldest and hottest days. They are easy birds to spot by their bright yellow heads.

# W

## WOODPECKERS

Ever notice the holes inside saguaro and other cacti around the Garden? Woodpeckers chisel these holes when they construct their nesting cavities within the cactus stem. Other birds will take up home in these holes once woodpeckers have vacated the cactus, establishing a home with a built-in security system of spines.

# X

## XERISCAPE

Look carefully at the placement of the plants in the Garden. Horticulture staff are very thoughtful about conserving water.



# Y

## YUCCA

The roots of yucca plants have served various ethnobotanical purposes, including soaps and the foaming agent in root beer.

# Z

## ZIZIPHUS MUCRONATA

Also known as the buffalo thorn, this tree grows in southern Africa. The Garden has two of these trees in propagation, which you can also see during a tour of the *Hazel Hare* Center for Plant Science.





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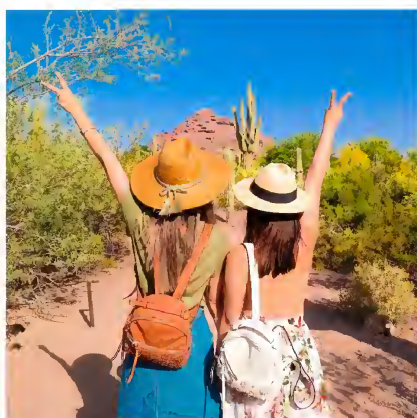
Stories from the Garden

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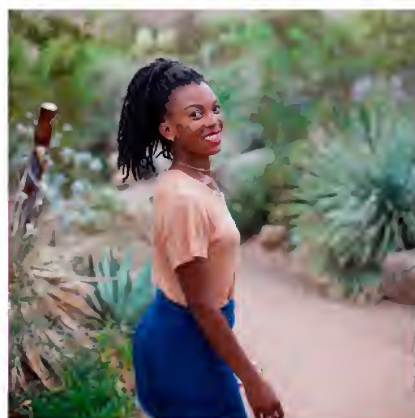
From humble beginnings to a “Phoenix Point of Pride,” Desert Botanical Garden is a compelling storybook of history. Not only does the Garden have a rich backstory of its own, visitors and members have chosen the Garden as the setting for creating their own precious memories. Each year, the Garden serves as the venue for proposals, weddings, family reunions, field trips and more. Smaller, private moments are no less impactful—like seeing a vibrant cactus blossom for the first time, smelling the fragrant creosote or hearing the chirping birds early in the morning. **Take a look at some of the memories our Garden visitors have shared on Instagram.**



**queenhorsfall** The great thing about new friends is that they bring new energy to the soul!"



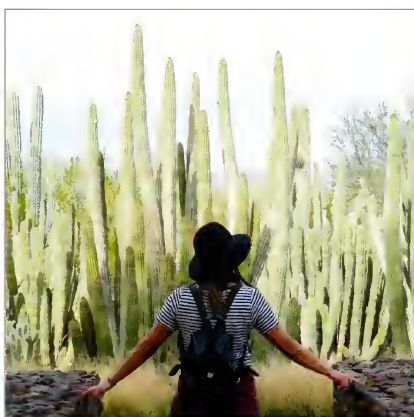
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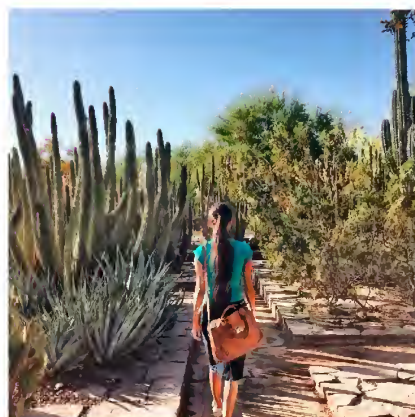
**sweetpotatosoul** Who else needs a daily dose of nature?! #phoenix #JennéAcrossTheUSA



**\_gingersweetie** This #gingersweetie just finished up the winter #seedlings program at @dbgphx & LOVED it ...



**imgauch** CACTILAND



**marsbar926** Wander > Wonder; take the risk or lose the chance.

Have a Desert Botanical Garden memory you want to share? Tag us on social or email us [Marketing\\_Staff@dbg.org](mailto:Marketing_Staff@dbg.org)



# GARDEN NEWS



## Garden Research Scientist Published in New Manual

Lucas C. Majure, Garden research scientist, was recently published in the "Manual of Vascular Plants of the NE United States and Adjacent Canada." Majure's specialty is cacti and other New World plant groups. He contributed a chapter on the Cactaceae of the Northeastern United States in the revised edition of the manual, which was based on his fieldwork in that region over the course of 10 years. The manual is a rich resource, serving students, conservationists, wildlife managers, educators, gardeners and citizen scientists. It is available online and in print.

"It was a great pleasure to work on this treatment of Cactaceae for the new manual, especially in light of recent advances of our knowledge of those species in that area based on contemporary research, much of which has come out of our lab," says Majure.



## Cactus Conservation Leaders Meet at Garden

Desert Botanical Garden hosted a three-day workshop with the International Union for Conservation of Nature (IUCN) this summer, reinforcing the Garden's global commitment to cactus conservation. IUCN finds partners worldwide to help conserve threatened species, and following the determination of the cactus family as the fifth most threatened group of species, the Garden became the host institute for the IUCN Cactus and Succulent Specialist Group (CSSG). During the conference, Garden staff and the CSSG discussed the operations of the partnership, roles and priorities and overall goals of the partnership. Initial goals outlined included producing an authoritative list of cactus names, globally assessing the agave family and increasing awareness of the partnership.

"The goals of the CSSG are ambitious, but they are completely achievable," says Garden Director of Research, Conservation and Collections Dr. Kimberlie McCue. "We have a committed group of experts and powerful connections through IUCN that gives us the opportunity to lead a global community toward the conservation and preservation of the cactus and other succulent groups."



## Garden Announced as the Host for Biology of CAM Plants Conference

In April, Desert Botanical Garden will serve as the location for the Biology of CAM Plants Conference—an international meeting of scientists to share new discoveries about evolution, ecology, genomics and engineering of Crassulacean Acid Metabolism (CAM) traits and species. CAM plants have evolved their photosynthesis process to adapt to arid conditions. The conference is April 13, 2018



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## SONORAN QUARTERLY

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### Desert Botanical Garden's Mission

The Garden's commitment to the community is to advance excellence in education, research, exhibition, and conservation of desert plants of the world with emphasis on the Southwestern United States. We will ensure that the Garden is always a compelling attraction that brings to life the many wonders of the desert.



### City of Phoenix

PHOENIX OFFICE OF ARTS AND CULTURE

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# Las Noches de las LUMINARIAS

DESERT BOTANICAL GARDEN

**MEMBERS:** DEC. 1-3  
5:30 P.M. – 9:30 P.M.

1

**GENERAL PUBLIC:** NOV. 24-25,  
DEC. 8-10, 15-17, 19-23, 26-30  
5:30 P.M. – 9:30 P.M.



*: Throughout the Garden*

**MEMBERS:** ADULTS: \$25  
CHILDREN: \$10 (AGES 3-12,  
children under 3 admitted free)

**GENERAL PUBLIC:** ADULTS: \$30  
CHILDREN: \$12.50 (AGES 3-12,  
children under 3 admitted free)



Be a part of the rich Southwest holiday tradition of Las Noches de las Luminarias. This year, the Garden will be aglow for 21 magical evenings for guests to experience the beauty of more than 8,000 hand-lit luminaria bags, thousands of twinkling lights and the bold, monumental sculptures of Jun Kaneko. At almost every turn, be greeted by the sights and sounds of 10 local entertainment ensembles, including the bright colors of Ballet Folklórico Quetzalli and the festive music of Simply Three and Mother Road Trio. Dine at the Garden and stroll each path with a warm cup of cider or cocoa.

**TICKETS GO ON SALE TO GARDEN MEMBERS AT [DBG.ORG](http://DBG.ORG) OCT. 1**

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*Please note, the Garden will be closed Nov. 23 and Dec. 25. The Garden will close at 4 p.m. during each day of Las Noches de las Luminarias.*



# SONORAN QUARTERLY

SONORAN  
QUARTERLY  
WINTER 2017

VOLUME 71 N° 4

DEVOUR

IUCN AGAVE ASSESSMENT

**MOMIX**

THE GARDEN AND  
BALLET ARIZONA  
PARTNER AGAIN

*Photo by Eirini Pajak*



DESERT  
BOTANICAL  
garden



THE GARDEN IS  
HERE TO HELP YOU  
*enjoy* THE BEAUTY OF  
THE DESERT AND  
*care* ABOUT IT.

In last fall's *Sonoran Quarterly*, we introduced you to our Interpretive Master Plan (IMP), a project we have been developing for several years since receiving a grant from the Institute of Museum and Library Services (IMLS). The primary goal of the IMP is to find even better ways to communicate the Garden's mission to our members and broader community through clear and effective messaging.

As part of this effort, we reexamined the *Sonoran Quarterly* to ensure it reflects the goals outlined in the IMP. We wanted to make sure that each article relates to the Big Idea from the IMP, namely that "the Garden is here to help you enjoy the beauty of the desert and care about it." In addition to evaluating content, we also explored a new, more contemporary design.

Through the Big Idea lens, you might notice the stories in these pages always relate to the Garden's mission. You will learn about the incredible work our research and conservation team is doing with the International Union for Conservation of Nature (IUCN) to assess

agave species around the world and the threats they are under. We'll share some updates on the current state of our world-class collection of desert plants. We'll also savor the news that the Garden is the new home for Devour Culinary Classic, bridging the gap between the desert's natural tranquility and beauty with the excitement of a renowned culinary experience.

I hope you enjoy reading through the pages of our newly redesigned *Sonoran Quarterly*. A key component of the IMP is to open up the dialogue with you—our closest friends and supporters. I encourage you to join in the Garden conversation by sharing your thoughts with us. Follow our social media channels, and participate in conversations about how the Garden is advancing education, research, exhibition and conservation.

*Ken Schutz*

Ken Schutz

*Dr. William Huizingh*  
Executive Director





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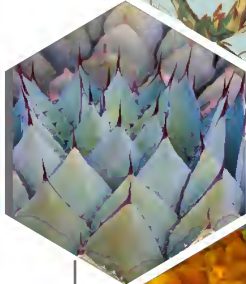
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## SONORAN QUARTERLY

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It seemed like a good  
idea at the time ...



by Howard Seftel

*devour*  
CULINARY CLASSIC

 LOCAL FIRST  
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 DESERT  
BOTANICAL  
garden



**MARCH 3 - 4, 2018**  
**TICKETS ON SALE NOW!**  
[dbg.org/devour-dbg](http://dbg.org/devour-dbg)

## *As The Arizona Republic's restaurant critic,*

it made sense for me to attend the first Devour food festival when it debuted in 2010. The two-day gourmet gathering attracted many of the Valley's top chefs. And I'd covered "West of Western," a predecessor event, during its five-year run.

But why not inject a little extra excitement into the proceedings? Instead of merely reporting on the goings-on, I decided to add an element of lighthearted competition: I would eat at every single booth and hand out "medals" of gold, silver or bronze for every chef's effort.

***I did not fully appreciate the ramifications.***

About half way through my happy-go-lucky 40-booth tour, I realized that I had literally bitten off more than I could chew. Way more. Lurching about in an over-eating fog, I somehow soldiered through the rest of the fare, staggered home and filed a column by my 6 p.m. deadline.

Then I flopped on the couch and slept for 16 hours, before returning for a repeat performance the next day. I was out of commission from Sunday night until the following Wednesday. I thought about taking up a less arduous line of work, like becoming a Navy SEAL.

Over the next few years, to deal with the event, I put together the kind of meticulous strategy that Ulysses S. Grant might have developed if he had laid siege to Devour instead of Richmond. I pretty much fasted the day before. I paced myself. Instead of whole swallows, I took dainty tasting bites. I didn't go back for seconds. (Yes, at that first event, I'd stupidly go get more of something I really liked.) I kept away from the alcohol.

By the end of the day, I was still zonked. But at least I still had the will to live.

But my personal travails were only part of the story. Maybe I should have seen it coming – honestly, it didn't occur to me at the time: To my astonishment, both the Devour chefs and readers took my "medals" very seriously.

And it ended up working out extremely well for event-goers. The chefs realized they needed to bring their "A" game if they wanted to impress the knowledgeable crowd. So when I knocked a chef for lazily serving bruschetta or a candy apple, it had an effect. One chef concocted—I'm not making this up—a foie gras float with candied nuts. I'm reasonably certain that my comments kept this beverage horror from ever again seeing the light of day.

These days, Devour no longer has to rely on an overstuffed local restaurant critic to evaluate the fare. Among 2018's high-powered judges are nationally renowned James Beard Award winners Scott Mowbray and Barbara Fenzl.

And this year, for the first time, you can make up your mind while strolling through the Valley's most glorious venue: the breathtaking Desert Botanical Garden.

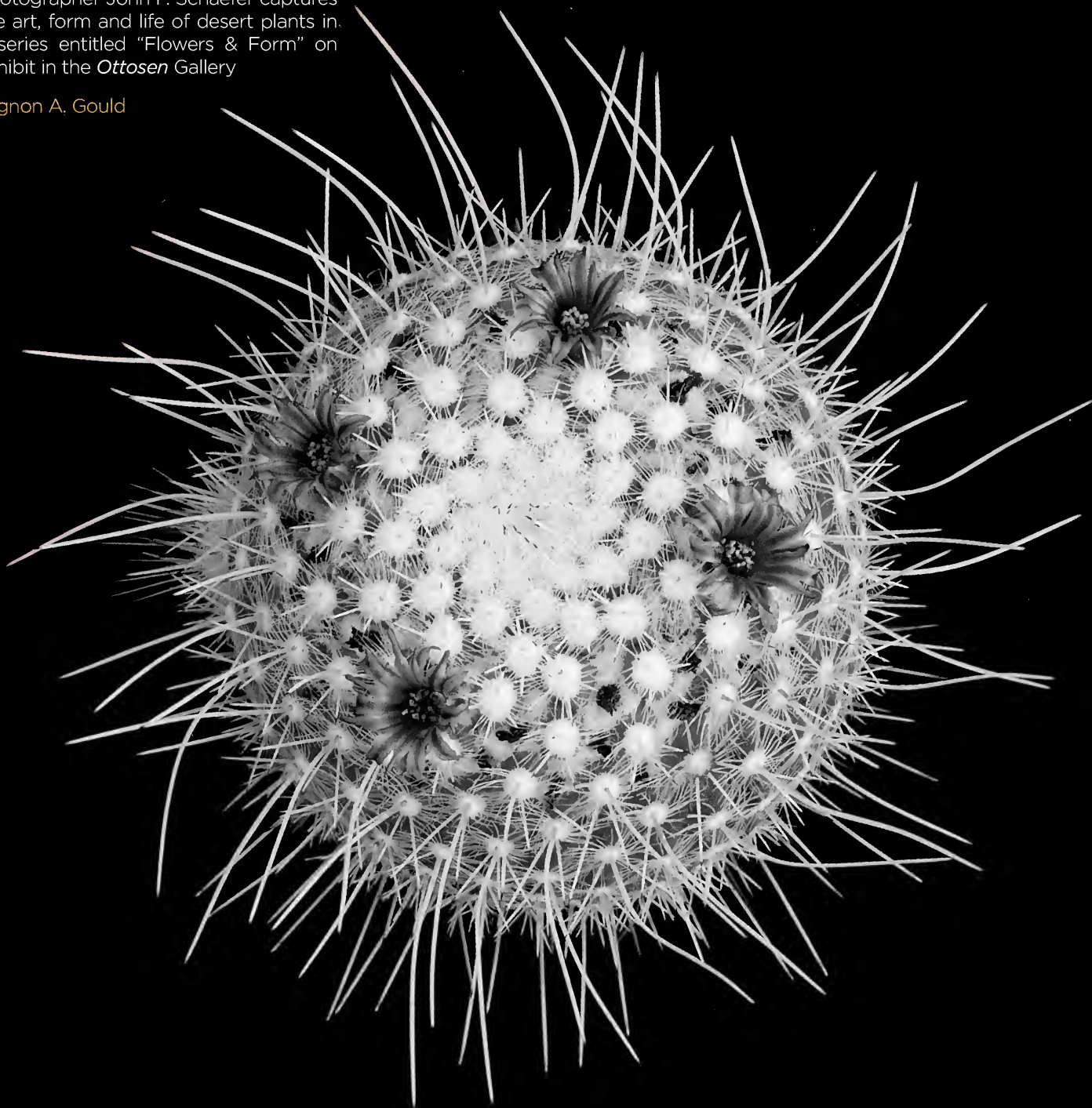
Can it get any better than feasting on gourmet fare surrounded by striking desert scenery in the March sunshine? Judge for yourself.



# DESERT PLANTS | A PHOTOGRAPHIC MUSE

Photographer John P. Schaefer captures the art, form and life of desert plants in a series entitled "Flowers & Form" on exhibit in the *Ottosen* Gallery

Mignon A. Gould



**T**he mysteries of desert plants span far and wide, from an aloe plant that stores water in its leaves to rare desert flowers that bloom after rainfall. Their rustic beauty is serene yet riveting. It's no wonder that Dr. John P. Schaefer, who has distinguished himself as an esteemed educator, best-selling author and acclaimed photographer, has chosen the desert jewels—cactus plants and flowers—as his photographic muse.



Schaefer has a Ph.D. in chemistry, a more than 20-year career as a professor and researcher and is President Emeritus of the University of Arizona. He founded the university's renowned Center for Creative Photography in 1975 with iconic landscape photographer Ansel Adams. Schaefer is also a conservationist and avid birdwatcher, who founded The Nature Conservancy in Arizona and helped organize the Tucson Audubon Society. He authored three best-selling books on photography, and his work has been featured in myriad publications, including *Arizona Highways*.

Since moving near a cactus farm in 2000, he has built his photographic repertoire, dramatically capturing the lively essence of desert flowers. He vividly describes his attraction to shooting desert plants, "Plant life in Arizona is really unique. They have habits that are unlike most plants. They leaf out when it rains, and in some instances, they bloom very briefly—usually just a day or two." Schaefer explains. "They have brilliant colors that really contrast with what the desert normally looks like. All those things make me take note of the plants and their flowers."

Starting Jan. 26 through May 20, 2018, Schaefer's photographic works of cactus plants and flowers, many shot at Desert Botanical Garden, will be on exhibit in the Ottosen Gallery. We recently caught up with Schaefer to discuss the upcoming exhibition, his creative process and his penchant for capturing plant life with painterly precision.

#### **HOW WOULD YOU DESCRIBE THE EVOLUTION OF THE DESERT SINCE YOU BEGAN CAPTURING IT IN YOUR PHOTOGRAPHY?**

The desert changes very slowly, until you get a developer coming in and plowing it up and building houses. That has certainly had a negative effect on the desert environment. But the desert is pretty much unchanging. You just leave it alone. These plants have learned how to survive the cycles of weather and climate for many, many centuries.

#### **DURING YOUR CREATIVE PROCESS, WHAT ARE YOU TRYING TO CAPTURE IN YOUR IMAGES?**

If I'm photographing the plants not in flower, it's the graceful shapes and geometry that are unique to these kind of plants that I find of interest. With the flowers, the colors are so incredibly intense. They spring forth from plants that are very drab-looking under ordinary circumstances, but once a year they burst forth with incredibly beautiful flowers. It's just hypnotizing.

#### **AS A FRIEND AND COLLEAGUE, HOW HAS ANSEL ADAMS INSPIRED YOUR WORK?**

He is recognized as one of the outstanding black and white landscape photographers of our time. He's an inspiration to people in photography, to show how well it can be done. I've learned techniques from him, to a certain extent—my vision of what is beautiful, what is memorable and what is photographic.

#### **THERE IS A PERFORMATIVE NATURE TO MANY PLANTS YOU'VE PHOTOGRAPHED—A SUCCULENT THAT APPEARS TO BE EXTENDING A STEM OR A CACTUS THAT LOOKS LIKE THE ORBITING MOON. WAS THIS INTENTIONAL OR WHAT YOU HAPPENED TO CAPTURE IN THAT MOMENT?**

This is what I see when I look carefully at the plant—a photograph, stars and galaxy, and some of the swirling shapes of the plants. Often they have shape, symmetry and thorn patterns that are really very intriguing.

#### **WHICH PIECE IS YOUR FAVORITE AND WHY?**

I like the Arizona Queen of the Night. It's an incredibly beautiful flower, very large. It comes out of one of the most unattractive looking sticks you ever saw growing in the desert. It opens up as the sun goes down and then wilts in the morning, soon after the sun comes up. You have to photograph it just at dawn.

It also has the most wonderful perfume. Actually, very few cactus flowers have a scent. They depend on color to attract the pollinators. But the Queen of the Night has a very wonderful perfume that attracts a certain kind of moth and that's the way it is pollinated.

**EXHIBIT | JAN. 26 - MAY 20**

**VISIT [DBG.ORG/EVENTS](http://DBG.ORG/EVENTS) for more details.**

**VISIT [DBG.ORG/BLOG](http://DBG.ORG/BLOG) for the full interview**  
**[DBG.ORG/BLOG/JOHN-SCHAEFER-PHOTOGRAPHY](http://DBG.ORG/BLOG/JOHN-SCHAEFER-PHOTOGRAPHY)**





# Tancer

## DISTINGUISHED SPEAKER SERIES

Featuring :  
**LATTIE COOR**

*Dr. Lattie Coor was the inaugural presenter at speaker series, where the first Desert Landscape School (DLS) certificate was presented for the revised program.*

Mignon A. Gould

In October, the *Tancer* Distinguished Speaker Series kicked off with Dr. Lattie Coor, former Arizona State University President, presenting. The speaker series' sponsors are Robert and Shoshana Tancer, who are long-time supporters of Desert Botanical Garden. Mr. Tancer, Trustee Emeritus of the Garden, has been pivotal in developing and promoting the new DLS. The program offers gardeners, professionals and homeowners an opportunity to learn about desert landscaping and earn a credential upon completion.

"The efforts and prestige of the DLS will improve the quality of landscape professionals from landscape architects to professionals who actually tend the gardens," Tancer explained.

**"THEIR KNOWLEDGE OF THE LATEST AND STATE OF ART TECHNIQUES WILL BE REFLECTED IN THEIR WORK, WHICH WILL RESULT IN HIGHER QUALITY GARDENS."**

The Tancers invited Coor to be the first speaker in the series. Coor spoke about the importance of lifelong learning and cultivating new skills throughout one's life, which is an initiative of DLS. During the event, Mr. Tancer presented a certificate to Thom Berger, the first recipient of the new credential from the program.

"It was a great honor to be recognized as the first DLS graduate in the new program during the recent Tancer event," Berger stated. "The theme of his presentation was continuing education, which aligns with my life goals as I look for new challenges and opportunities."

1

*Dr. Lattie Coor and Mrs. Elva Coor*

2

*Robert Tancer, Shoshana Tancer,  
Elva Coor, Dr. Lattie Coor*

*Lifelong* LEARNING











# SINCE ITS ESTABLISHMENT IN 1939, DESERT BOTANICAL GARDEN HAS BEEN BUILT ON THE **SPIRIT OF PHILANTHROPY.**

Clare Hahne

The Garden might not have come to fruition without co-founder Gertrude Webster's commitment and generosity. The Garden has realized Mrs. Webster's vision to be a compelling attraction that brings to life the many wonders of the desert.

Garden donors, volunteers and members continue to embody that spirit through contributions of time, treasure and talent. On Nov. 8 at the Association of Fundraising Professionals Celebration of Philanthropy luncheon, several Garden donors and volunteers were recognized for their generosity.





## Ardie and Steve Evans | AFP 2017 Outstanding Philanthropists



The AFP Greater AZ Chapter presented Ardie and Steve Evans with the 2017 Outstanding Philanthropist Award. The Garden nominated the couple for their exceptional leadership and generosity, following completion of *The Saguaro Initiative (TSI)*—the Garden’s multi-year campaign to pave the way for the future. An array of community leaders and nonprofit organizations have also benefitted greatly from the Evans’ involvement, and these partners collaborated with the Garden to nominate the Evans for this special award.

*“As individuals and as a team, this remarkable couple has given generously of their time, considerable talents and funds to help Valley nonprofit organizations to make our city and state a more vibrant and healthy place to live,”*

says Desert Botanical Garden’s Director of Development Beverly Duzik. “The Evans’ generosity helped the Garden complete three major capital expansions and endowment building initiatives over the past 20 years. Completion of the \$18 million *TSI* goal would not have been possible without them.” Ardie and Steve led the second phase of *TSI*, giving their time to strategy sessions, cabinet meetings and cultivation events. In addition, their generous donation of \$1.1 million helped the Garden surpass its *TSI* goal of \$18 million.

“As the chair of the Patrons Circle committee, (which creates programs for our major donors) Ardie was laser-focused to bring in new members, engage them and assure that they became long-term supporters of the Garden,” says Garden Board President Shelley Cohn. “Patrons Circle programs under her leadership were recalibrated to make sure they simultaneously were meaningful to attendees and met their goals of raising funds for the Garden.”

## Marilyn Wolfe and Archer Shelton | 2017 Desert Botanical Garden’s Spirit of Philanthropy



The Garden honored Marilyn Wolfe and Archer Shelton with the 2017 AFP Spirit of Philanthropy award.

Marilyn and Archer have demonstrated exceptional generosity, donating 12,000 hours and more than \$350,000 to the Garden. In addition to their succeeding leadership roles as president of the Volunteers in the Garden Board of Trustees, each actively served on the *TSI* cabinet.

*“Their spirits and generous personal gifts inspired many fellow volunteers to participate in this special campaign, advancing the Garden’s efforts to help our community enjoy the beauty of the desert and care about it,”*

says Dr. William Huizingh Executive Director Ken Schutz. “Marilyn and Archer deserve tremendous credit for their role in nurturing philanthropy from volunteers, which yielded more than \$3 million in gifts from individuals who generously give their time and talents.”

*Marilyn and Archer join a prestigious list of honorees. Take a look at past winners.*

## Desert Botanical Garden Spirit of Philanthropy Award Winners

1991	Virginia Ullman
1993	Dr. William Huizingh
1995	Volunteers in the Garden
1996	Marilyn and Jon Shomer
1997	Ross Conner
1998	Hazel Hare
1999	Jacquie and Bennett Dorrance
2001	Carol Schilling
2002	Rose Papp
2003	Nina Mason Pulliam Charitable Trust
2004	Barbara Weisz
2005	Oonagh and John Boppart
2006	Barbara and Donald Ottosen
2007	Joy and Howard Berlin
2008	Lee and Mike Cohn
2009	Jan and Tom Lewis
2010	Marta L. Morando
2011	Melissa and Ted Lagreid
2012	GoDaddy.com
2013	Volunteers in the Garden
2014	Kate Baker
2015	Sam and Betty Kitchell Family
2016	Jeff Hebets
2017	Marilyn Wolfe and Archer Shelton





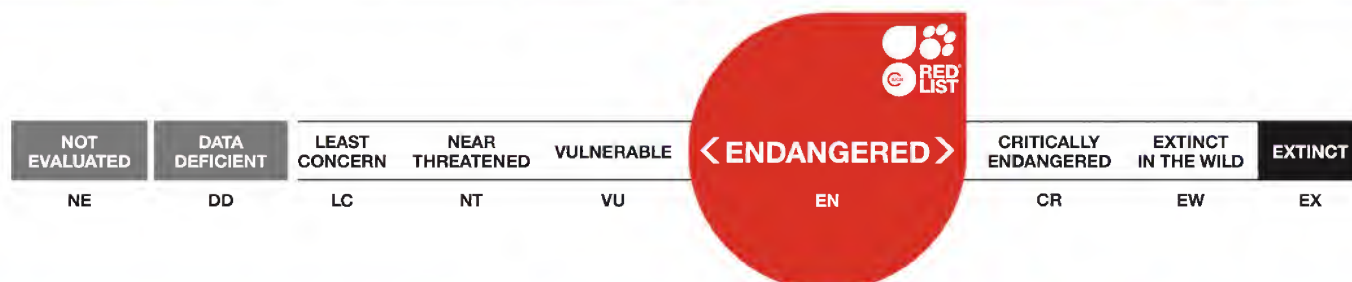
# THE AGAVE FAMILY:

## Thriving *or* Threatened?

Desert Botanical Garden joins forces with The International Union for Conservation of Nature (IUCN) to assess the conservation status of the agave family

Mignon A. Gould

From mammals and birds to fish and reptiles, myriad species have been designated as endangered and likely to become extinct if conservation action is not taken. So it should not be surprising that plants could be threatened, too. One such group of plants is the agave family (*Agavaceae*), which includes species of agave but also yucca, manfreda, hesperaloe and others. The range of this plant family extends across the southern tier of the United States, the Caribbean, throughout Mexico, and into Central





and South America. Desert Botanical Garden in partnership with IUCN—the global authority on the conservation status of species—has embarked upon a mission to assess which are thriving and those that are threatened.

The Garden is the host institute for IUCN's Cactus and Succulent Plant Specialist Group (CSSG). In collaboration with Dr. Bárbara Goettsch, chair of CSSG, the Garden's Dr. Kimberlie McCue, director of research, conservation and collections, is tackling this ambitious project with other members of the Garden's research and conservation team, including Wendy Hodgson, curator of the herbarium and senior research botanist; Dr. Andrew Salywon, associate herbarium curator and research botanist; Raul Puente-Martinez, curator of living collections, research botanist; and Dr. Lucas Majure, biologist of new world succulents.

The assessment process is facilitated through the IUCN Red List of Threatened Species, the world's most comprehensive inventory of the global conservation status of biological species. Many factors are considered when assessing the conservation status of any species, including the overall numbers of individuals, the range of the species and major threats globally.

The first and only assessment of the agave family was conducted between 1995 and 1996, and the results were published in 1997. Hodgson was the lead coordinator during that assessment for the Species Survival Commission, a division of IUCN. Although the first assessment included valuable data on rareness, vulnerability and threats—more information is still needed for a complete evaluation of the group.

"The first assessment provided much-needed information and the groundwork, upon which future work can be built," Hodgson explains. "Fast forward 20 years, and this next assessment will be far more informative, with degrees of rareness and abundance better determined based on more detailed ecological information and formulas."

This assessment will be a guide to prioritize those species in most need of protection. McCue describes it as an in-depth process, one in which the Garden team, including Hodgson, were trained on during a preliminary three-day workshop on conducting assessments.

Deciding to assess a species isn't always due to a presumed threat, but can also be a preventative measure.

**"No one has looked at this group of plants in their entirety to assess what their status in the wild is,"** McCue says.

"Doing a Red List Assessment won't just tell us what's endangered and what's threatened. It will also tell us what's doing ok, what's not threatened, what's thriving and what's secure in the wild."

The largest group of species in the agave family is the genus *Agave*. The richest diversity of agaves is found in Mexico, where many species have significant economic value, including the species from which comes tequila. With more than 200 species of agave worldwide, many are known for their varied uses as food, fiber and drink.

In February 2018, a workshop will be held in Mexico, where many of the species' experts are located. The purpose of this workshop is to gather the research and knowledge of the agave family species in one central place for review and analysis. After the workshop, the data will be analyzed holistically to also determine the status of the family overall.

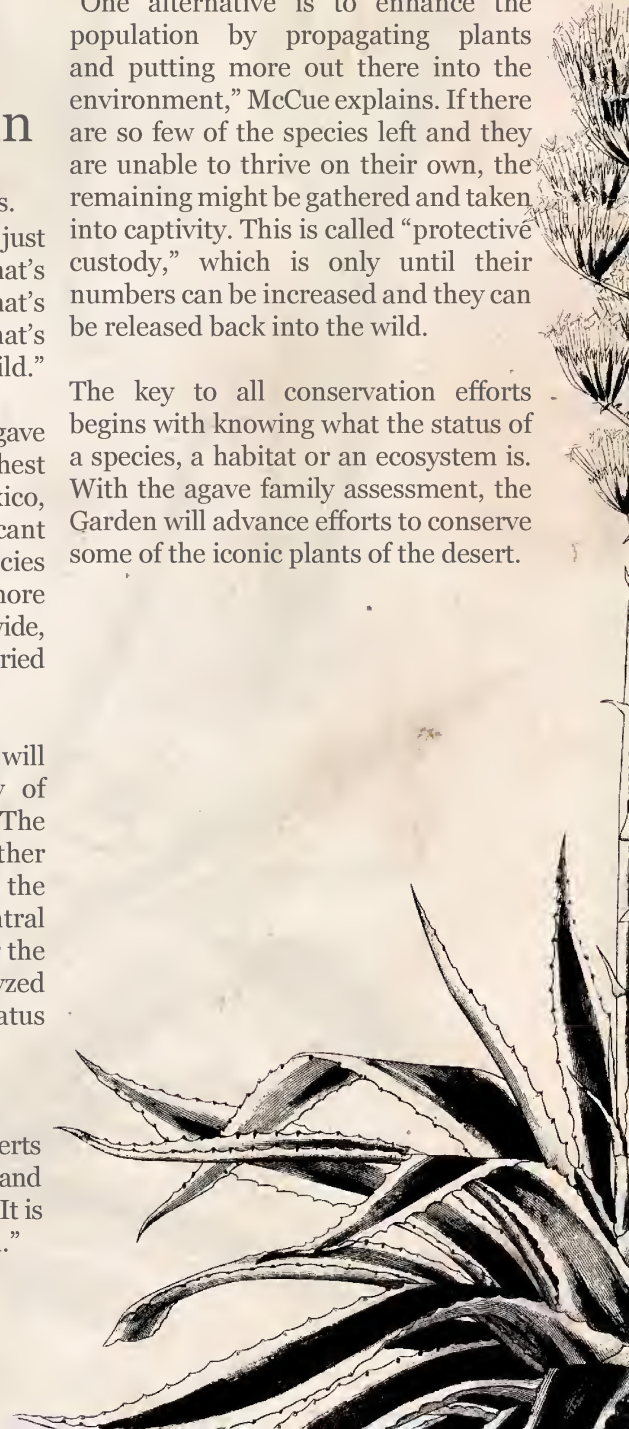
"In the simplest terms, doing these assessments means bringing the experts together literally to sit around a table and go species by species," McCue says. "It is an amazing and powerful approach."

Part of the assessment of the hundreds of agaves will be to rank them on a nine-level scale ranging from 'Not Evaluated' to 'Extinct.' Currently, there are two species of agave that are classified through the IUCN Red List. *Agave lechuguilla* is rated as least concern (level three), and *Agave caymanensis*, which has received an endangered status (level six) due to habitat loss and the threat of fire which is used to clear land for agriculture in the Cayman Islands, the only place this agave grows naturally.

So, what happens when a species is thought to be endangered?

"One alternative is to enhance the population by propagating plants and putting more out there into the environment," McCue explains. If there are so few of the species left and they are unable to thrive on their own, the remaining might be gathered and taken into captivity. This is called "protective custody," which is only until their numbers can be increased and they can be released back into the wild.

The key to all conservation efforts begins with knowing what the status of a species, a habitat or an ecosystem is. With the agave family assessment, the Garden will advance efforts to conserve some of the iconic plants of the desert.





# A WORLDLY TOUR OF DESERT BOTANICAL GARDEN'S PLANTS

When walking through *Ottosen* Entry Garden here at Desert Botanical Garden, guests are enchanted by the spectacular desert views of towering cactus, red rocks of the Papago Buttes and lush plant beds. However, many don't realize that the Garden's plants are actually from all around the world—not just what grows here in Arizona. Take a look at this small sample of plants in our collection and their origins.

Raul Puente Martinez  
Curator of Living Collections



**SAGUARO**  
(*Carnegiea gigantea*)



**UNITED STATES AND MEXICO**  
*Throughout the Garden*

One of the most iconic of the Sonoran Desert plants, the saguaro is considered a foundation plant providing food and refuge to many animals. Native Americans such as the Tohono O'odham depended on its fruits for food, and the harvest was a very important event in their social life. We have more than 1,000 saguaros at the Garden, of which, 200 have reproduced naturally.

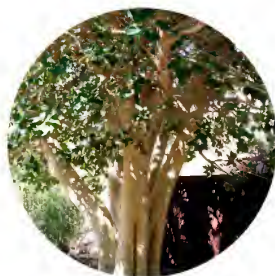


**TUNO**  
(*Opuntia hondurensis*)



**HONDURAS**  
*South of the Sybil B. Harrington Cactus and Succulent Galleries*

An arborescent prickly pear native to Honduras in Central America, this tree has short, red flowers that produce lots of nectar to attract hummingbirds—its main pollinator. Nectar is also secreted through extrafloral nectaries in the areoles of flowers, which also attract numerous ants. Several plants grow just south of the *Sybil B. Harrington Cactus and Succulent Galleries*



**ROCK FIG**  
(*Ficus palmeri*)



**MEXICO**  
*NW Corner - Sybil B. Harrington Cactus and Succulent Galleries*

This large, broad-leaf tree with a very distinct yellow smooth trunk got its name for the fact that roots grow spreading and hugging rocks in its natural habitat in the Pacific Coast of Mexico. Some trees can be very large—upward of 30 feet tall and 50 feet wide canopy. A large, old specimen can be seen in the Northwest corner of the *Sybil B. Harrington Cactus and Succulent Galleries*.



**CHAÑAR**  
(*Geoffroea decorticans*)



**CHILE AND ARGENTINA**  
*Quail Run*

Walking along Quail Run, you will come across two large trees with peculiar green and defoliating bark. The chañar is native to the dry areas of northern Chile along the Atacama Desert. In spring, they get covered with small, fragrant yellow flowers, which attract thousands of bees, and in the summer, small round fruits are produced. The fruits are used in Chile to make a type of syrup.





**TOOTHPICK CACTUS**  
(*Stetsonia coryne*)



**ARGENTINA**  
*Kitchell Family Heritage Garden*

One of the most striking columnar cactus that can be seen at the Garden is the toothpick cactus, which common name derives from the numerous, long (up to 4 inches) spines in each areole. Although our plants are large, they are only half the size they reach in their native habitat.



**GIRAFFE TREE**  
(*Acacia erioloba*)



**NAMIBIA AND SOUTH AFRICA**  
*Agave Section*

This is a large, upright tree that is about 30 feet tall, creating a wonderful shade for many tender plants. The large tree in the middle of the Agave Circle was grown from seeds collected in South Africa. The specific epithet *erioloba* means ear-like due to the large seed pods.



**MOPANE**  
(*Colophospermum mopane*)



**ANGOLA AND BOTSWANA**  
*West side of the Jan and Tom Lewis Desert Portal*

Also called butterfly tree because of the bi-lobed leaves that resemble a butterfly. Two mature specimens can be found on the west side of the *Jan and Tom Lewis* Desert Portal. The trees are semi-evergreen, shedding a few leaves during the summer. They make a nice shade tree or can be used as a focal point in a garden.



**ALGARROBO NEGRO**  
(*Prosopis nigra*)



**ARGENTINA AND PARAGUAY**  
*Quail Run*

A close relative to our native mesquite tree, the algarrobo negro, is native to the Gran Chaco region of Argentina. A large tree with wide canopy can be seen in the Garden along Quail Run across from the chanar tree. In Argentina, the fruits are harvested and processed into flour.



**WEeping WATTLE**  
(*Peltophorum africanum*)



**BOTSWANA, CONGO, MALAWI, NAMIBIA, MOZAMBIQUE, SOUTH AFRICA, SWAZILAND, ZAMBIA AND ZIMBABWE**  
*West of Schilling Library*

A very attractive medium-size tree with fern-like foliage and bearing racemes of bright, yellow flowers during spring. The Garden has two trees that were propagated from seeds collected in 2004 in Botswana. It seems to be well adapted to the Arizona climate with no signs of stress during summer or winter and receiving low amount of water through drip irrigation. One tree grows in front of the *Schilling Library*.



**CANDELABRA TREE**  
(*Euphorbia ingens*)



**MALAWI, NAMIBIA, MOZAMBIQUE AND ZIMBABWE**  
*Sybil B. Harrington Cactus and Succulent Galleries*

Two very large columnar succulents can be seen in the middle of the *Sybil B. Harrington Cactus and Succulent Galleries*, and they are the Candelabra tree. A member of the spurge family (Euphorbiaceae), the candelabra tree is a relative of the popular poinsettias. The tree-like characteristic has evolved as an adaptation to life in the tropical deciduous forests of southern Africa.



Did you know Desert Botanical Garden's collections of *Cactaceae* and *Agavaceae* are among the most complete? Through the efforts of our dedicated Garden community, the Garden has grown its collection into one that is truly unlike any other in the world. Enjoy this annual review of where our desert plant collection stands.

# STATE OF THE COLLECTION

CURRENT ASSESSMENT OF THE

*Agave Family* (*Agavaceae*) *Our Agave collection is one of the largest and most complete in the world.*

**4,026**  
TOTAL PLANTS

**248 / 345** TAXA\*  
IN OUR CURRENT COLLECTION

**7 / 8** GENERA\*  
IN OUR CURRENT COLLECTION

**72%** OF KNOWN TAXA\*

**15** NEW SPECIES  
ADDED IN 2016



**FALSE YUCCA**  
*Hesperaloe*

**Taxon**  
Garden's collection

**5 / 8**  
known species



**SPANISH BAYONET**  
*Hesperoyucca*

**Taxon**  
Garden's collection

**2 / 2**  
known species



**SPANISH DAGGER**  
*Yucca faxoniana*

**Taxon**  
Garden's collection

**43 / 49**  
known species



**COW'S HORN AGAVE**  
*Agave bovicornuta*

**Taxon**  
Garden's collection

**186 / 212**  
known species

\* **TAXA** : a taxonomic group of any rank, such as a species, family, or class.  
\* **GENERA** : a principal taxonomic category that ranks above species and below family.



*Mammillaria microhelix***Mammillaria**

Garden's collection

$$\frac{132}{171}$$

known species

**BIG NEEDLE CACTUS**  
*Coryphantha macromeris***Coryphantha**

Garden's collection

$$\frac{48}{53}$$

known species

**BAJA ORGANPIPE CACTUS**  
*Stenocereus stellatus***Stenocereus**

Garden's collection

$$\frac{19}{28}$$

known species

**COPIAPOA DE FILLIPPI**  
*Copiapoa cinerea***Copiapoa**

Garden's collection

$$\frac{26}{30}$$

known species

CURRENT ASSESSMENT OF THE

# *Cactus Family (Cactaceae)*

*Our Cactus collection is one of the largest and most complete in the world.*

# 13,973

TOTAL PLANTS

$$\frac{1,320}{1,810}$$

# TAXA\*

IN OUR CURRENT COLLECTION

$$\frac{110}{125}$$

# GENERA\*

IN OUR CURRENT COLLECTION

# 73%

OF KNOWN TAXA\*

# 29

NEW SPECIES ADDED IN 2016

*Eriosyce aspillagae***Eriosyce**

Garden's collection

$$\frac{62}{68}$$

known species

**ISLA SAN PEDRO CACTUS**  
*Echinocereus websterianus***Echinocereus**

Garden's collection

$$\frac{82}{106}$$

known species

**BUCKHORN CHOLLA**  
*Cyllindropuntia acanthocarpa***Cyllindropuntia**

Garden's collection

$$\frac{33}{34}$$

known species

**TUNA COLORADA**  
*Opuntia stenopetala***Opuntia**

Garden's collection

$$\frac{123}{136}$$

known species

\*Edward Anderson (*The Cactus Family*, 2001)



# MOMIX'S



.....

DESERT BOTANICAL  
GARDEN AND  
BALLET ARIZONA  
PRESENT **MOMIX'S**  
**OPUS CACTUS**

Dana Terrazas

.....

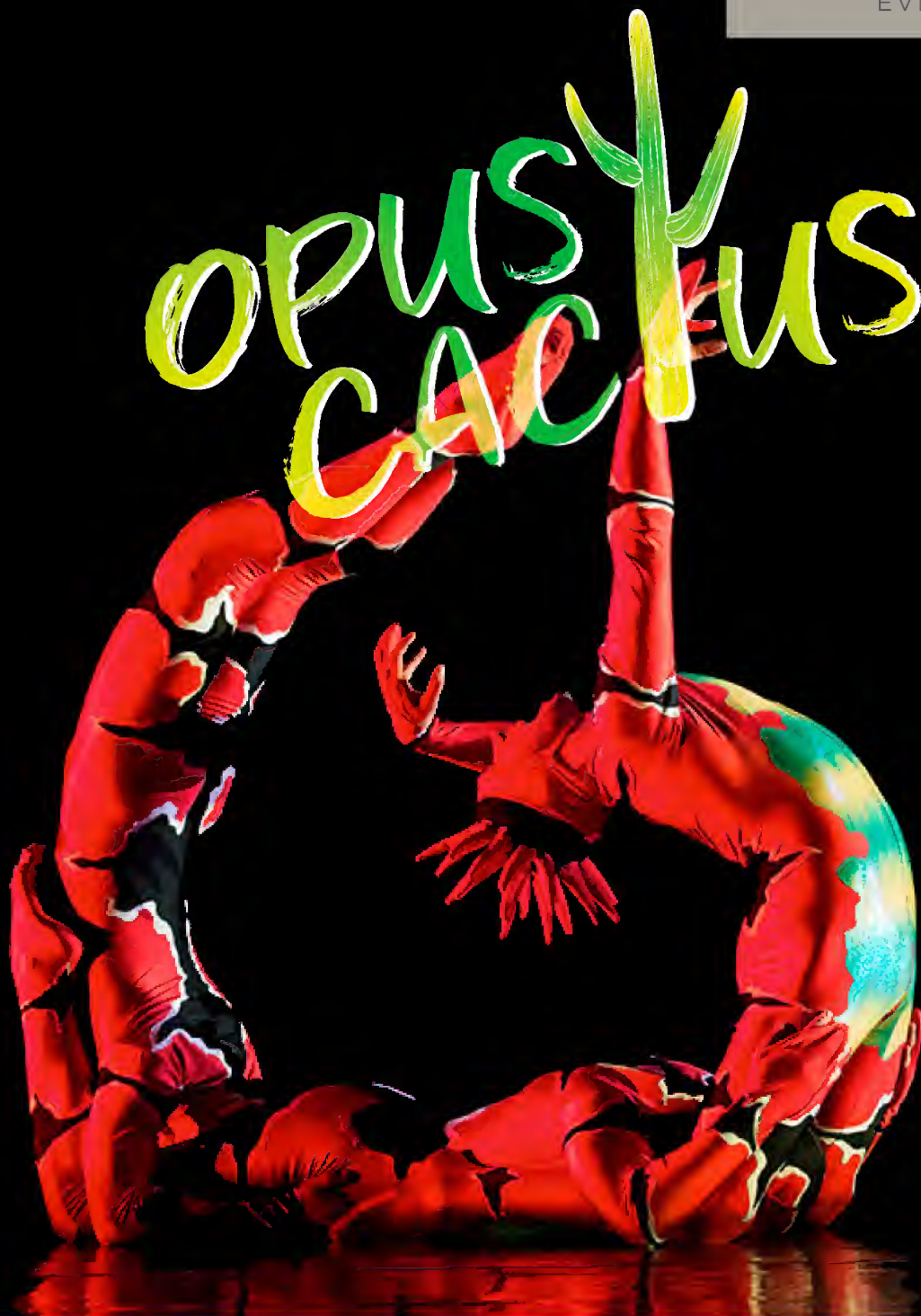
Ballet Arizona and Desert Botanical Garden are collaborating again for the return of MOMIX's Opus Cactus. Enjoy three dazzling performances Jan. 12-13 in the magical setting of the Orpheum Theatre.

Created in 1999 as a 20-minute act for Ballet Arizona, MOMIX's dancers take audiences on a dynamic journey where dancers become towering cacti, bringing the American Southwest

to life through the illusionistic style of Opus Cactus.

"One of the pillars of the Garden's programming is to explore the intersection of art and nature," says Ken Schutz, *Dr. William Huizingh* Executive Director. "The wonderful thing about this intersection is that each enriches the other. When we had the opportunity to co-present Opus Cactus with the Ballet, it was





an ideal addition to our ongoing relationship with them”.

“The dancers of MOMIX transform themselves with such skill that you’ll feel you’re in the midst of the desert with its creatures, cacti and mystery,” says Samantha Turner, Ballet Arizona’s executive director. “We’re thrilled to co-present this otherworldly production with the Garden.”

Since 2012, Ballet Arizona and Desert Botanical Garden have collaborated with the hopes of infusing art and nature in an unforgettable experience, challenging emotional boundaries. After three years of collaboration, Desert Botanical Garden and Ballet Arizona will continue their partnership until 2020. Arizonans and international visitors continue to be enchanted by works of art that embrace the desert as a backdrop.

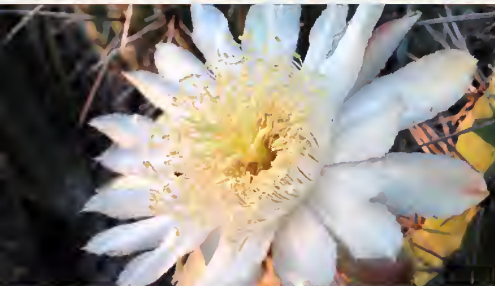
.....  
**TICKETS ARE ON SALE  
 NOW STARTING AT \$35.**

*For ticket information, visit  
[balletaz.org](http://balletaz.org) or call 602.381.1096.*  
 .....



# STORIES FROM THE *Garden*

SHAWN PAHL | @DESERT\_OASIS | PHOENIX, AZ | 60.8K FOLLOWERS



## How long have you been a member and how did you first discover Desert Botanical Garden?

I've been a member since 2011. I first came in late 2009 and visited multiple times in 2010 before deciding to get a membership. Now my sister renews my membership as a Christmas gift each year, which has provided me with endless enjoyment. I don't remember my first visit, but I was drawn to a place in the middle of a giant city with a large array of plants and wildlife. From the first visit, I was hooked.

## For those who may not already follow you, can you explain what people can find on your Instagram page in your own words?

Arizona. Period. I strive to document Arizona landscapes in a wide variety of environments. My photos show the amazing diversity and beauty that is spread throughout this amazing state. Photographs spanning different climates, elevations and time zones is what they can expect.

## What is your favorite place in the Garden? Any plants that are your favorite to photograph?

I love the entire Garden! There are some great places to visit depending on the time of the year. Visit the *Harriet K. Maxwell* Desert Wildflower Loop Trail in the spring and the *Sybil B. Harrington* Cactus and

Succulent Galleries in the early summer for fantastic blooms. As far as my favorite plants to photograph, it would be cactus blooms, but specifically Claret Cup and other varieties of Hedgehog Cactus blooms. The vibrant orange/red/pink color is like nothing I've ever seen before, and it absolutely mesmerizes me every season they bloom. I also love the *Echinopsis* blooms for their stunning variety of endless color as well as their brief bloom cycle.

## Can you tell us how the Garden has influenced your life/career?

Immensely. I use inspiration from the Garden to drive my passion for environmental education and conservation. As the environmental, health and safety manager for my company, I have the Garden to thank for leading me into my field. It has provided me a place to experience some of the best desert plants in the world right in my backyard and that has always made me appreciate the unique desert around me.

## What is your favorite Garden memory?

Dale Chihuly is hands down my greatest memory of the Garden. I'm still in awe. I felt his art was/is the perfect contrast to the Garden's landscape. I visited the exhibit so many times to see it in a variety of light. Morning, day and night all had such jaw-dropping views that I had to keep coming back for more. A partially cloudy day still stands out as one of my most memorable Garden experiences (and there are many).





## JUN KANEKO

SCULPTURE AT DESERT BOTANICAL GARDEN

**NOW THROUGH MAY 13**

Uncover Kaneko's colorfully glazed ceramic and bronze forms in the rich backdrop of the Garden's desert flora.  
*Sponsored by APS*

## CORKS & CACTUS

FEB. 10  
AND 11



## AGAVE ON THE ROCKS

MAR. 30



## GARDEN PROJECT

*Performed by*  
Michael Brown,  
Alexander Fiterstein,  
Elena Urioste  
and Nicholas  
Canellakis

**APR. 8**



## SPRING MUSIC IN THE GARDEN

SELECT THURSDAYS & FRIDAYS  
FEB. 2 - JUN. 22





# IN APPRECIATION

## THE SAGUARO INITIATIVE

Honor Roll of Supporters

The Garden looks forward to recognizing all the generous supporters of The Saguaro Initiative in the 2017 Annual Report.

## DESERT BOTANICAL GARDEN MEMBER SUPPORT

The Desert Botanical Garden is grateful to all 29,216 members and donors for their support. Acknowledged in this section are annual Curator's Circle, Director's Circle, President's Circle and Founder's Circle members and donors giving \$2,500 or more over the year, from Sep. 1, 2016 and Aug. 31, 2017. Included are memberships and unrestricted gifts to support the Garden's annual operations.

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The Desert Botanical Garden is honored to acknowledge the following individuals who have included the Garden in their estate plans as of Aug. 31, 2017.

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\*Those whose gifts have been realized.

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An alliance between the Desert Botanical Garden and the business community. Acknowledged in this section are annual members at the Palo Brea, Palo Verde, Mesquite, and Ironwood levels, as well as corporate and foundation donors who gave \$2,500 or more over the quarter, from June 1, 2017 through Aug. 31, 2017.

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 Fabulous Food Fine Catering & Events  
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## HONOR & MEMORIAL GIFTS

Tribute contributions are used to provide for the Desert Botanical Garden's horticulture, education, and research programs. Gifts may also be recognized in the Garden. For more information, please call Kelsey Wolf-Donnay at 480.481.8147. These contributions have been received from June 1, 2017 through Aug. 31, 2017.

## HONOR GIFTS:

In Honor of Gloria Anderson  
 Michael Dugan

In Honor of Jill Andrews  
 Saramae Teich

In Honor of Marilyn & Cliff Douglas  
 Ken Schutz & Craig Thatcher

In Honor of Robert Schofield  
 Tim Schofield

In Honor of Marilyn & Jon Shomer  
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## MEMORIAL GIFTS:

In Memory of Fat Halpert Bartlit  
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In Memory of Phillips Burnside  
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In Memory of Joe Gazda  
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